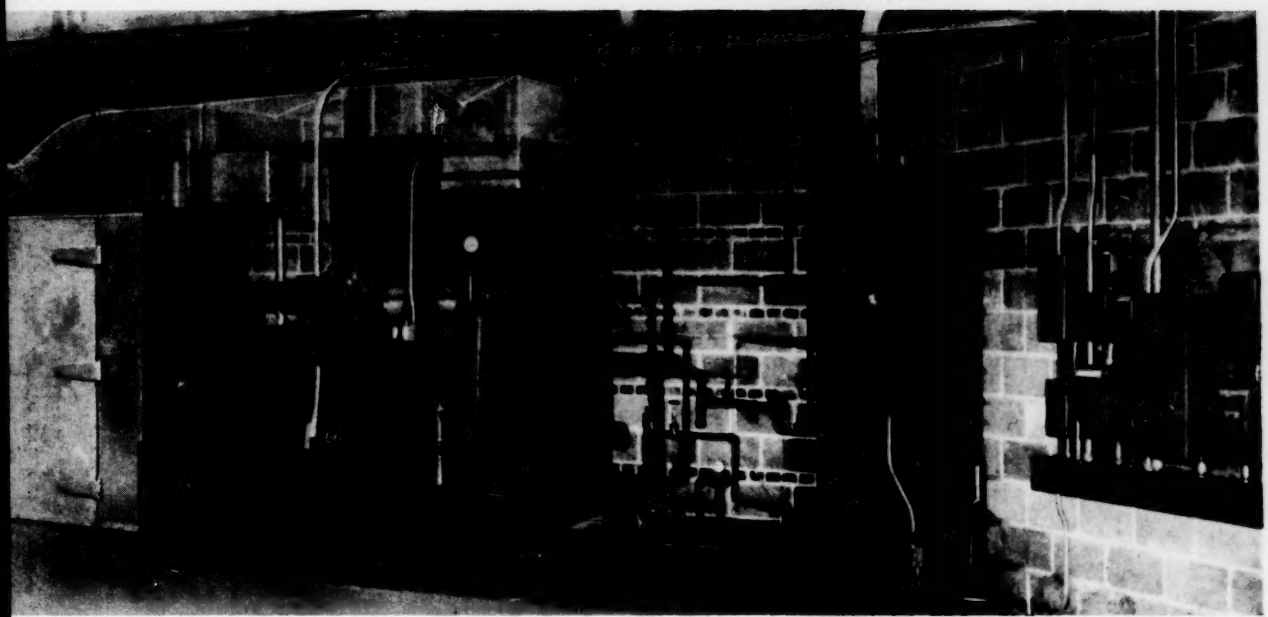
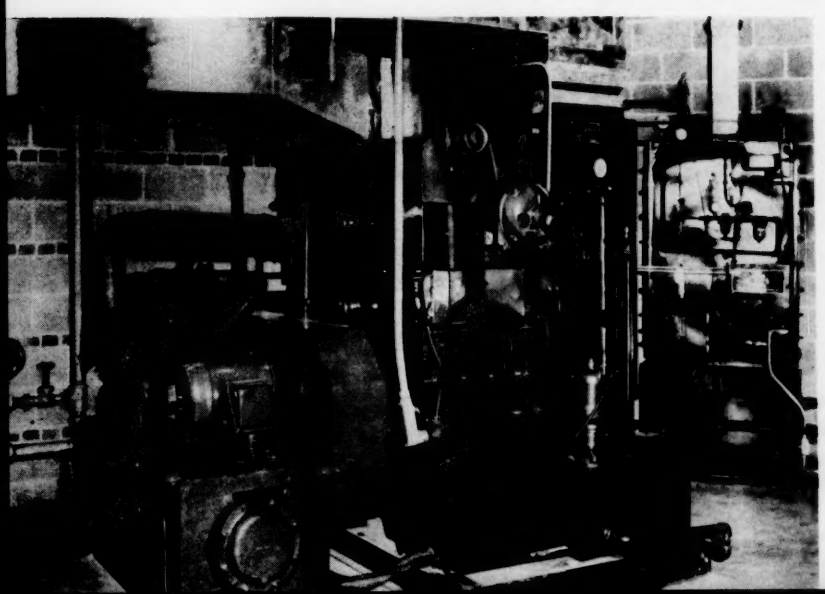
INDUSTRIAL REFRIGERATION

NOVEMBER
1959
Vol. 137 No. 5

Serving the Industrial Refrigeration and Air Conditioning Industry

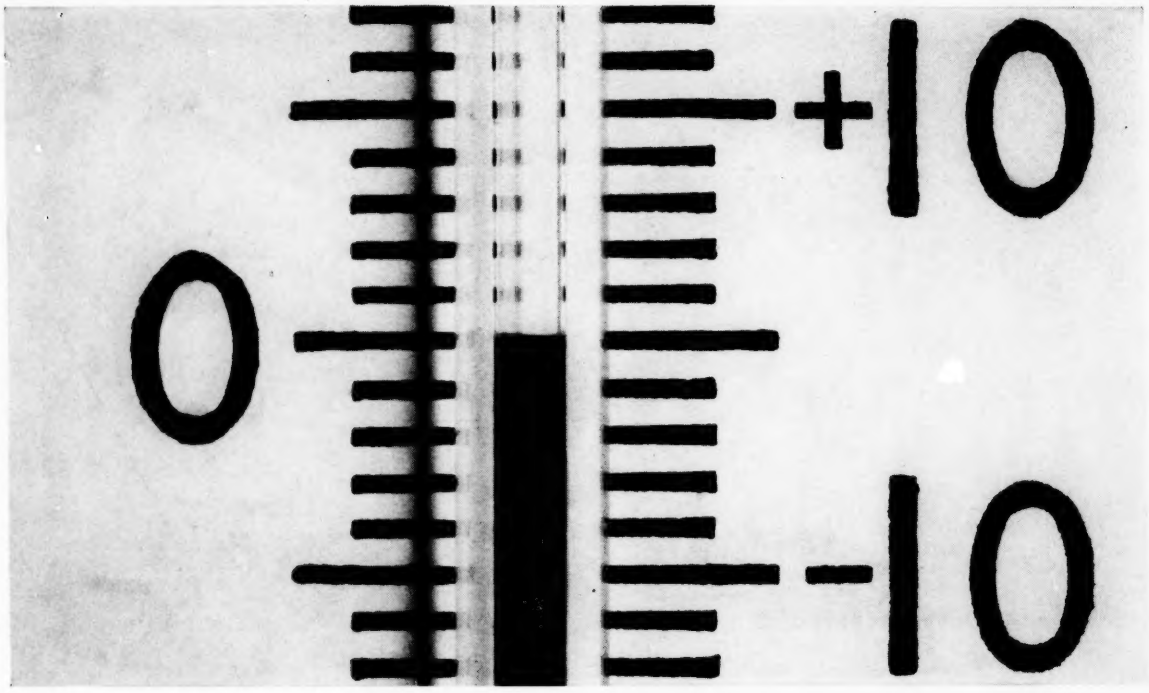




Factory Assembled Units Give Close Air Control Over Shellac Production

Southern Shellac Maker Now Operates Year-Round Without Worry; Regrind Operations Cut

Hygrol System Provides Continuous Dehumidified Tempered Air For Drying



Zero in on Frozen Foods with genetron®

SUPER-DRY REFRIGERANTS

From packing house to supermarket, actual zero temperature (or lower!) is *always* needed to maintain freshness, quality and flavor of frozen foods and to prevent spoilage. That's why you can't take chances. Whatever way your frozen foods are transported—by rail, truck or on board ship—however they are packed, stored or sold—they need the sure protection of modern refrigeration equipment . . . and dependable "Genetron" fluorinated hydrocarbon refrigerants.

"Genetron" Super-Dry Refrigerants are available from refrigeration and air-conditioning wholesalers from coast to coast. See your wholesaler. Insist on "Genetron" in *all* your frozen food refrigeration equipment!

Quick Facts on "Genetron" Super-Dry Refrigerants

- Guaranteed exceptionally low moisture content
- Noncorrosive to standard equipment materials, nontoxic, nonflammable, stable, safe
- Critical and freezing points well outside range of operating uses
- Solvent action on oil helps prevent solidification or congealing of lubricant; aids in lubrication of equipment; generally miscible with oil
- Freely interchangeable and may be mixed in any proportions with comparable fluorinated hydrocarbons meeting the same strict refrigerant specifications

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genetron 12 WHITE LABEL CCl_2F_2 DICHLORODIFLUOROMETHANE
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genetron 113 PURPLE LABEL $C_2Cl_3F_3$ TRICHLOROTRIFLUOROETHANE
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Allied Chemical

GENERAL CHEMICAL DIVISION
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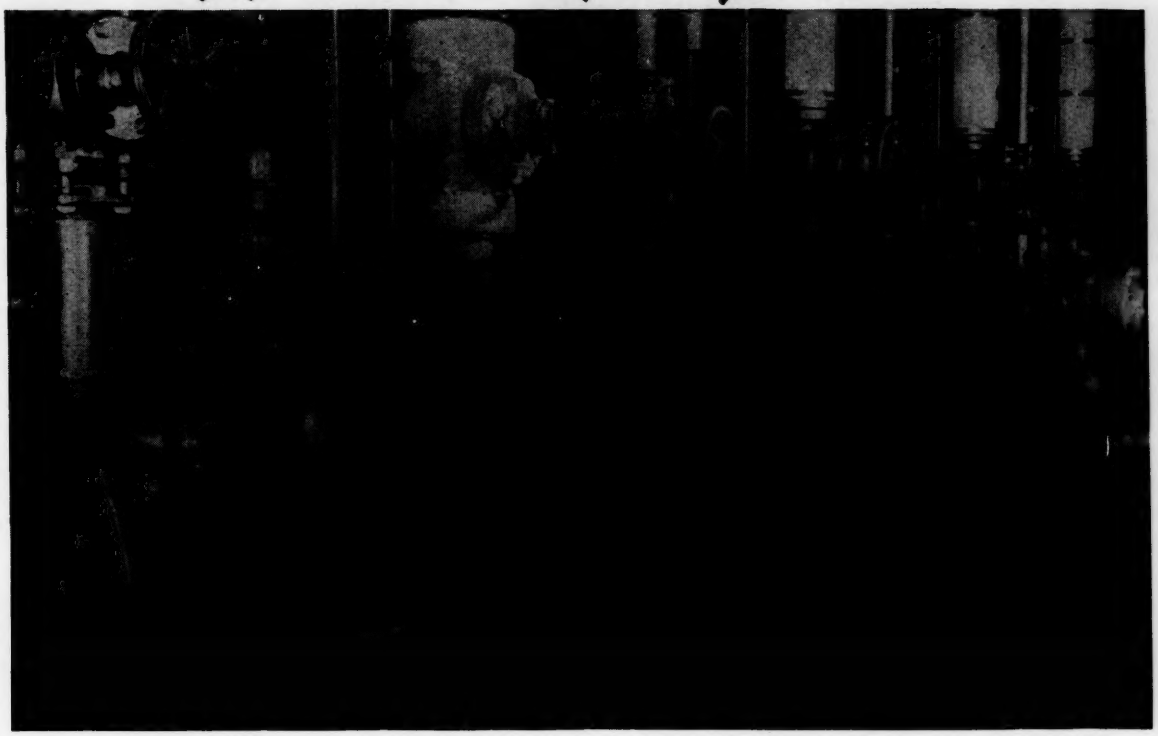
More Proof of **FES-FULLER** *Superiority*



Merchants Refrigerating Company Selects FES-FULLER ROTARY BOOSTERS . . .

Merchants new frozen food warehouse in Vinita Park, Missouri is one of the newest and most up-to-date in the country.

Four FES-Fuller Rotary Boosters serve three storage rooms with space to accommodate 14 to 15 million pounds of frozen foods and ten blast freezer tunnels with total capacity of 100,000 pounds of food per day. Flexibility of operation allows the two stage refrigeration system to match widely variable refrigeration requirements.

Here is another example of where FES-Fuller Rotary Boosters are serving in a vital capacity on a modern frozen food warehouse. Simplicity in Rotary Booster design guarantees low maintenance and operating cost.

If you are planning to increase capacity, lower temperature or build a new plant, it will pay you to write for complete information about FES-Fuller Rotaries.

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Qualified distributors in principal cities
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How to Cut Refrigeration Costs and Increase Capacity with Better Purging

If you don't have an Armstrong Purger, chances are your head pressure is 10 to 40 lbs. above theoretical—because all the non-condensables are not being removed from your system. Have you checked your pressure lately?

Remember, for every 4 lbs. excess head pressure, power costs go up 2% and capacity goes down 1%. You can quickly figure how much inefficient purging is costing you.

Your head pressure will *always* be within a couple of pounds of theoretical with an Armstrong Purger. It rids your system of air with almost no loss of refrigerant.

Here is what this means to you:

Lower Power Costs
"Power costs cut 20%"—Rubenstein & Son Produce, Inc., Dallas, Texas.

Increased Capacity
"Compressor capacity increased 10%"—Gulf Oil Corporation Wax Plant, Philadelphia, Pa.

Less Refrigerant Used
"$500 annual ammonia saving"—Howard Johnson Ice Cream Mfg. Plant, Baltimore, Md.

Less Cooling Water Needed
"Cooling water consumption cut in half"—Producers' Dairy Company, Brockton, Mass.

Time and Labor Saved
"Can take care of other duties while purging is going on"—engineer at Alta Vista Creamery, Forth Worth, Texas.

Safety and dependability are assured by the design of the Armstrong Purger. Its forged steel construction can withstand over 2000 lbs. hydraulic pressure. Working parts are stainless and heat-treated chrome steel.

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Bulletin No. 700 tells . . . How air in your system raises operating cost . . . Why efficient operation requires controlled purging . . . How the Armstrong Purger operates . . . Design features of the Armstrong Purger . . . Specifications and prices . . . Specific benefits enjoyed by present users.

Please send me a free copy of Bulletin No. 700.

Armstrong Machine Works
8606 Maple Street, Three Rivers, Michigan

Please send me a free copy of Bulletin No. 700

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November, 1959

Number 5

Vol. 137

Industrial Refrigeration

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Delegates to the International Institute of Refrigeration meeting at Copenhagen have returned and first papers are being released. Danish hosts instituted a new medal for applied research.

Practical Refrigeration Engineers Open Their 50th Year 24
Professor Dick Zach, University of Wisconsin Instructor, released the New Orleans meeting program featuring 10 educational events with 18 prominent refrigerating figures. The NAPRE opens its golden anniversary celebration.

Advancing Technology Demands Manpower Upgrading 26
Boss' expectations of the modern refrigeration engineer are outlined by Dean R. Woolrich. Four technician-practical-men required for each professional engineer, says this consultant.

New Orleans Cold Storage — A Modern Distribution Link 30
Public refrigerated warehouses are still a major conservation step in the chain of food distribution, NAPRE members will learn in December. Selected as the major field trip feature is the New Orleans Cold Storage & Warehouse Co., Ltd.

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COVER: Air Contitioning System, Southern Shellac Company

HYGROL System illustrated furnishes conditioned air to conventional tunnel dryers at the Southern Shellac Co. Air is dehumified to approximately 30 F dewpoint, 62 F dry bulb *under all atmospheric conditions*, permitting the manufacture of bleached white shellac without interruption in all seasons of the year.

Without this conditioning, normally moist atmospheric air at the necessary drying heat caused the shellac particles to fuse into a hard mass, sometimes requiring two or three regrinding operations before the required five percent moisture content could be attained. In addition to such production losses there would be four or five weeks per year in which production was impossible because of high ambient humidities.

'Hygrol' is the registered trademark of Niagara Blower Co.

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REFRIGERATING PEOPLE IN THE NEWS

Manufacturing Changes And Appointments

TRRF Life Membership For Dr. "Dutch" Diehl

▶▶FIRST DIRECTOR of The Refrigeration Research Foundation, **Dr. H. C. "Dutch" Diehl,** was awarded a certificate of Honorary Life Membership in the executive committee dinner meeting on October 24, 1959, at the LaSalle Hotel, Chicago, Ill. The Board of Governors, TRRF, had elected "Dutch" to honorary membership at their April meeting.

Dr. Diehl retired at the end of the calendar year 1958, after serving as the Foundation's only Director since it was formed January 1944. His successor is **Dr. Walter A. Maclinn.**

One other Honorary Membership is held in the Foundation, by **Professor Dr. Rudolf Plank,** President Emeritus, Technische Hochschule, Karsruhe, West Germany.

Present when Foundation President Millard W. Young made the certificate presentation were: Don Horton, Executive Vice President, American Warehousemen's Ass'n.; Gil Stecker, Treas., TRRF; Ken Stepleton, Pres., Continental Freezers, Inc.; Dr. Carl Koonz, Swift & Co.; Dr. Gail Dack, Food Research Institute, University of Chicago; Dr's. Wm. T. Pentzer and Wm. F. Talburt, USDA.

More TRRF Directors and Executive Committeemen in attendance: Dr. Walt Maclinn, W. C. Baker, P. D. Burrill, S. A. Kadane, G. A. Shoemaker, and J. W. Straub. Other Directors present were: J. F. Meagher, and F. L. Lockwood. Also attending: Mack Hunt, Asst. Treas., TRRF and Dick Powell, Exec. Vice Pres., National Association Refrigerated Warehousemen. Pete Cooper, Terminal Refrigerating & Warehousing Corp., A. T. Hampson, Merchants Cold Storage & Warehouse Co., H. P. Schmitt, Res. Dir., National Association Frozen Food Packers, Russ T. Prescott, USDA, and Dick Kelahan, INDUSTRIAL REFRIGERATION, were among the invited guests.

Congratulatory messages were read by President Young, from: A. N. Otis. Merchants Refrigerating Co., Prof. Carl F. Kayan, Columbia University, A. W. Oakley, Jr., Hudson Refrigerating Co. and Vallee O. Appel, Fulton Market Cold Storage Co.

Guided Research Projects

For more than 30 years "Dutch" has been known as a vigorous crusader and dynamic leader in the industry. In his capacity as Director of the Foundation he administered the Foundation's research program which actually consists of grants and aids to colleges and universities, state and Federal research agencies, and private research organizations working in commodity fields influenced by refrigeration. Some of the grants in aid actually involved engineering, physical and operating phases.

Dr. Diehl

Dr. De Graff

Dr. Diehl is the author of many government publications and reports, as well as author of articles in professional and trade journals (including INDUSTRIAL REFRIGERATION), dealing with harvesting, handling, storage, processing, freezing and transportation of fruits and vegetables. He served as a member and often chairman, of many national and international bodies, and is at present Managing Director of TARS, Inc.

DeGraff, New Public Member

▶ A VACANCY in the board of directors of The Refrigeration Research Foundation since its annual meeting in April, has been filled with the election of **Dr. Herrell DeGraff,** Professor of Food Economics, as a new member representing the public.

Professor DeGraff is one of the outstanding scientists on the staff of the Graduate School of Nutrition, Cornell University. He was consultant to the Rockefeller Foundation development program in Mexico in 1952, and in Colombia in 1953. He is an Economic Consultant to the Secretary of Agriculture and Research Director, American Cattlemen's Association.

SAC Member Honored

▶**Professor Walter V. Price,** University of Wisconsin, and TRRF Scientific Advisory Council member, receives the first Paul-Lewis Award in cheese research at the annual meeting of the American Dairy Science Association.

Refrigerated Warehousemen Get Wichita News Billing

Officials of cold storage firms discuss freight rates and transit privileges which are calculated to boost Wichita frozen business. Left to right seated, C. J. Dolloff, chairman, Wichita Chamber of Commerce Traffic and Transportation Committee, Paul Fisher, manager, Kansas Cold Storage, Inc., J. Walter Shaw, rate consultant, C. of C. Transportation Department, and Lee Waller, vice-president and general manager of Wichita Ice & Cold Storage Company. Standing: George M. Brown, president of Wichita Ice and vice-president of Wichita C. of C. and John L. Bear, president of Kansas Cold Storage.

▶▶MEMBERS of the National Association of Refrigerated Warehousemen were prominent in a civic movement at Wichita, Kansas, which resulted in new freight rate agreements being negotiated with the railroads in the area. Through the efforts of the Traffic and Chamber of Commerce, Wichita, business men and producers in the area received lower rates and transit privileges which expanded the frozen fruit, juice and vegetable business in that are. Rates were established June 15.

John L. Bear, president of Kansas Cold Storage said in an article in the WICHITA MAGAZINE that the new rate adjustment and transit privileges would give Wichita frozen food packers an unlimited opportunity for expansion. **Lee Walker,** vice-president and general manager, Wichita Ice and Cold Storage, predicted in the same publication by the Wichita Chamber of Commerce, that the operation would accelerate to 400 carloads of new business per year.

More ▶

NEW! KRACK ELECTRIC DEFROST UNIT COOLERS

"BUC-ED" Series for R-12 and R-22 Refrigerants

"BUC-ED" coolers are especially designed and engineered to meet the demand for a dependable electric defrost unit at a moderate price. They are available in single, double and triple fan models for ceiling mounting. Sizes range from 400 to 3600 BTU per hour per 1° T.D.—maintain air circulation at ideal flow rate. Like all KRACK coolers, the "BUC-ED" models produce at rated capacities and eliminate the need for specifying costly "oversize" equipment.

Krack has pioneered the way in electric defrosting for over 20 years—this experience, coupled with production know-how, makes it possible to offer a superior value unit at a competitive price.

Panel of housing removed to show electric defrost distributor.

OUTSTANDING DESIGN FEATURES:

- Heated double drain pan with 1" insulation
- Air drawn over coil
- Built-in full size heat exchanger on sizes up to BUC 1600 ED
- Electro-tin-plated copper tubes
- Heavy gauge galvannealed steel housing
- Baked enamel finish
- Balanced, corrosion-proof fan blades
- Rubber mounted motors
- Built-in liquid refrigerant distributor
- Cadmium plated D-nuts and bolts

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Manufacturers of Freon, Recirculated, Flooded or Direct Expansion Ammonia Heat Transfer Equipment

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Baker Elected President; Fifth Election This Year

▶▶ELECTED president of the National Association of Refrigerated Warehouses in April, was **William C. Baker** of Produce Terminal Cold Storage Co., Chicago. Baker has the dictinction of being elected president five times, but not president of NARW each time. At a recent meeting of the board of directors of his company he was named president. **W. A. Sizer,** former president of Produce Terminal was named chairman of the board.

Frozen Food Changes

▶OTHER PERSONNEL changes reported in the NARW COLD FACTS are the new officers at Seabrook farms. They are **C. F. Seabrook,** Honorary chairman, **John B. Fowler,** Chairman of the Board, **Samuel Winokur,** president; **Manning M. Exton** and **Wm. B. Clements,** vice-presidents. **John** and **Courtney Seabrook** resigned following purchase of the farm by Seeman Brothers of New York. **Fred Carlton,** also formerly with Seabrook has joined the Cold Storage Division of the Atlantic Company to handle public relations, sales and service.

New Members Appointed To Building Advisory Group

▶▶AIR CONDITIONING for comfort and hygenic advantages has received another recognition for its growing stature, in the recent member appointment to the Building Research Advisory Board of the National Academy of Sciences–National Research Council. **Donald R. Bahnfleth,** Engineering Editor of HEATING, PIPING AND AIR CONDITIONING, Chicago is one of three new members. The other two are John P. Gnaedinger, president of Soil Testing Services, Inc. Chicago, and Dr. Sherman J. Maisel, Professor of Business Administration, University of California. Dr. Albert G. H. Dietz is the committee chairman. The appointments were made by Robert M. Dillon, BRAB Executive Director.

Stop-over Privileges

The agreement permits shipment of bulk material to be stopped at Wichita for transit operations such as storage processing or repackaging at a carload rate of $1.68/cwt. This compares with a previous rate of $1.95/cwt. If the material is reshipped within one year to Eastern destinations, the through-rate of 27 cents/cwt. will be charged for the remainder of the trip to Eastern points. Transit charges negotiated were reduced from the cwt tariff to a flat charge, which amounts to a savings of about $40.00 per car. Operators and cold storage warehouses now are able to stop bulk shipments of such items as frozen corn, peas, beans, carrots and repackaged foods for retail sales and ship them to Eastern markets on demand.

Dr. Bass

B. L. Wilson

Dr. French

Advancements at NBS

▶APPOINTED Chief of the Free Radicals Research Section, National Bureau of Standards, is **Dr. Arnold M. Bass.** He succeeds **Dr. Herbert P. Broida** who left in September for a year at Cambridge University. Dr. Bass has been assistant chief of the Section since it was established in 1956. One technique developed in this program is the trapping and storing of molecular fragments at very low temperatures.

Bruce L. Wilson, formerly chief of the Section has been appointed chief of the Mechanics Division, NBS. He succeeds **Dr. Walter Ramberg,** who joined the Department of State as Science Officer in Rome.

Sanitarians Elect

▶▶AT ITS 46TH ANNUAL MEETING in August, the International Association of Milk and Food Sanitarians, an organization that has worked closely with major refrigerating firms and food producing industries, advanced **William V. Hickey** of New York to the presidency. He succeeds **Franklin W. Barber,** National Dairy Research Laboratories.

New president-elect and second in command is **John J. Sheuring,** Professor of Dairy Manufacturing, University of Georgia. **Charles E. Walton,** City Sanitarian, Laramie, Wyo., is first vice-president and **Ray Belknap,** Senior Milk Sanitarian, Iowa State Department of Health was elected 2nd vice-president. **Vincent T. Foley,** Chief Food Sanitarian Kansas City, Mo. Health Department, was re-elected secretary-treasurer.

Sanitarian's Award

▶FOR DEVELOPING a safe and sanitary milk supply for a growing new community in a comparatively new Canadian province, **William Kempa,** dairy and milk inspector for the city of Regina, Saskatchewan, has been awarded the highest professional honor in his field, the *Sanitarian's Award.*

Bestowed annually by IAMFS, it carries with it a check for $1,000. The presentation was made at the 46th Annual Banquet.

John D. Faulkner, Chief of the Milk and Food Program, U. S. Public Health Service, Washington, D. C., was presented the *Citation Award* of IAMFS. Bestowed annually by the Association to salute outstanding service to it and to the advancement of the professional status of all sanitarians, the award this year honored a past president.

New DuPont Position

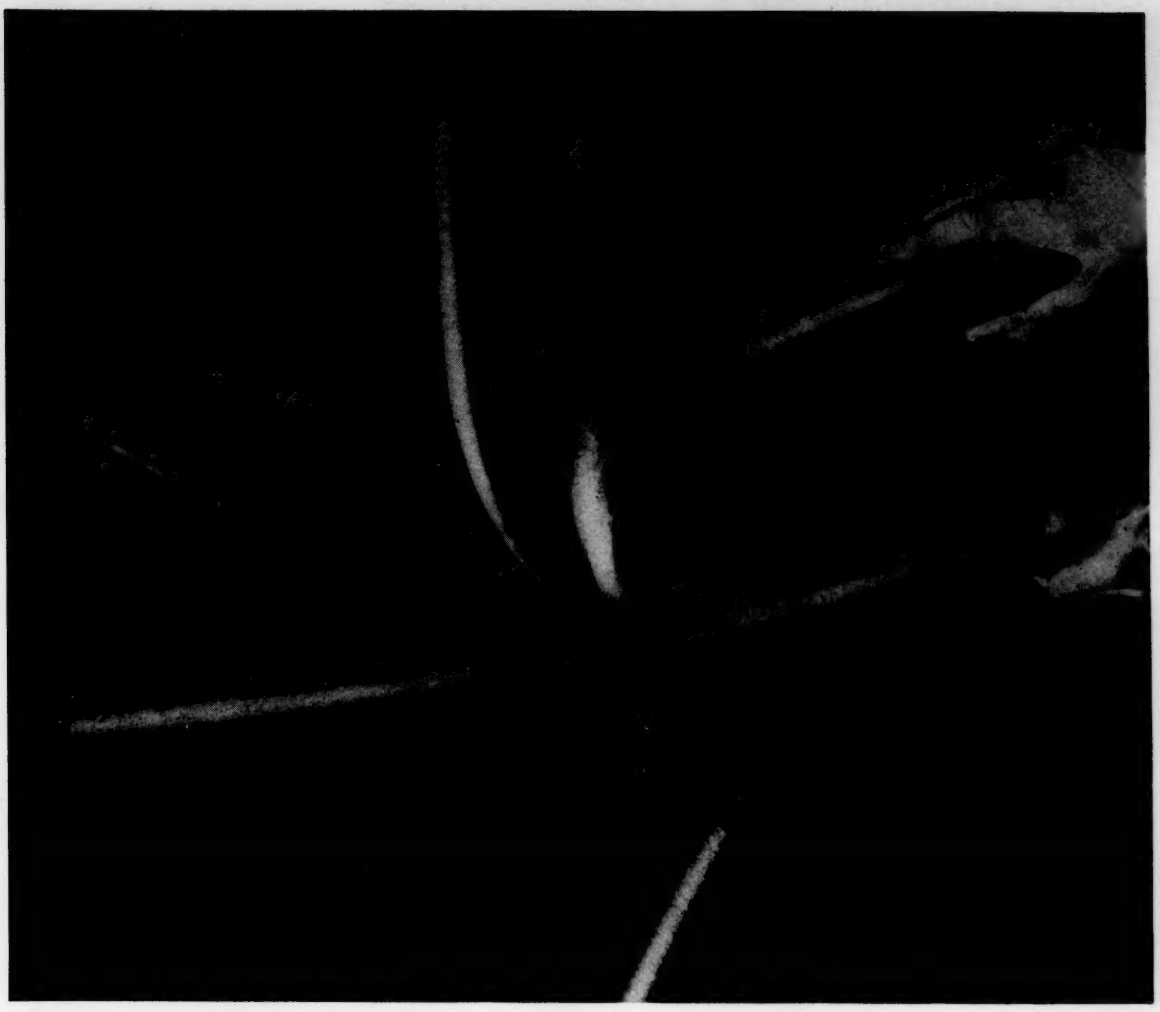
▶▶APPOINTMENT of **Dr. Frank E. French, Jr.,** to the newly created position of manager, New Product and Market Development, "Freon" Products Division, DuPont Company, was announced September 8. Since 1956 he was assigned to the company's Development Department in Wilmington. He had previously been assistant technical superintendent of the East Chicago Works, Industrial and Biochemicals Department. A native of Cincinnati, Ohio, he joined the company in 1948 following an assistant instructor berth at his Alma Mater, MIT, Chemical Engineering Department.

Omission Department

▶▶IR's EDITORIAL STAFF has been asked by a number of readers why persons pictured on the cover of the August issue were not identified. Technically speaking, the point of the photograph was to emphasize water conservation which in this instance happens to be a measurable achievement.

Principal figures pictured apparently didn't think it was necessary to be identified, but it is IR's aim to please, so they are, left to right, **William E. Kahlert,** vice-president-sales, Baltimore Aircoil Co.; **Robert E. Callahan,** EssKay chief power plant engineer; **Uno R. Olson,** EssKay mechanical superintendent; and, **John Engalitcheff, Jr.,** president, Baltimore Aircoil Co. (It is hoped that more readers will promptly communicate with our editorial department when they feel particulars have been omitted.)

(Continued on Page 36)



Armaflex is extremely flexible, follows contours of piping or tubing without special cutting.

Highly flexible Armaflex pipe covering goes on fast, cuts labor costs in half

Highly efficient, Armaflex stops condensation on refrigeration and air-conditioning lines. Its closed cell structure completely seals out air and moisture.

So flexible it can be tied in knots, Armaflex pipe covering helps speed the insulation of fluid cooling lines. It reduces labor costs as much as 50% compared with the cost of applying conventional insulations to pipes and fittings. Armaflex can be slipped over pipe or tubing before connections are made. It follows contours readily. Or, the covering may be slit lengthwise, snapped in place, and cemented at the joints. Fitting covers are quickly fabricated from miter-cut pieces.

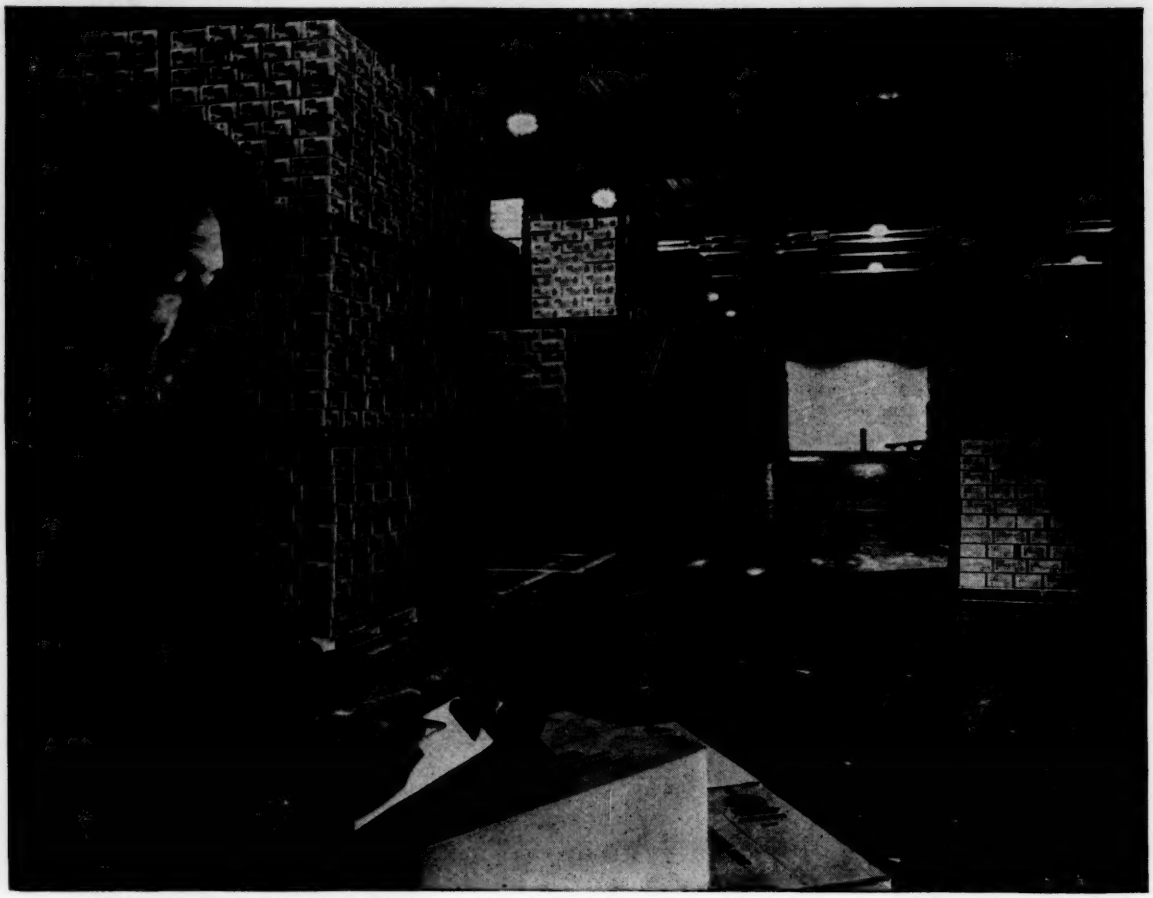
Made of foamed plastic, Armaflex has a closed cell structure that seals out air or moisture. No separate vapor barrier is needed. Armaflex is an unusually efficient insulation with a k-factor of 0.28 at 75° mean temperature.

Because Armaflex now comes in three wall thicknesses — 3/8", 1/2", and 3/4" — you can specify the economical amount* of insulation needed to stop condensation, or to save heat, on lines operating from 200° F. down to zero. Armaflex is available in 6' lengths and sizes up to 3" I.P.S. For larger piping, Armaflex sheets are used.

* Recommended Armaflex thicknesses for various service conditions are contained in a free descriptive booklet. For your copy, write Armstrong Cork Company, 2211 Skye Drive, Lancaster, Pennsylvania.

Armstrong INSULATIONS

DOW | INSULATION



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Keeps maintenance costs low . . . permanently!

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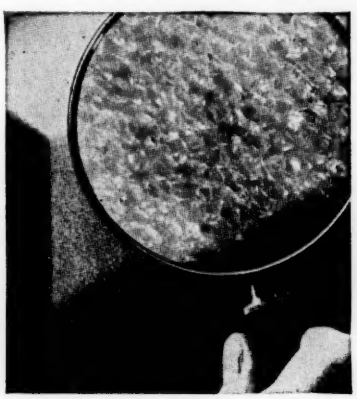
MAINTENANCE COSTS GO DOWN because this rigid plastic foam insulation contains millions of tiny non-interconnecting air cells having high resistance to the passage of water and water vapor. With Styrofoam there's no water pickup . . . no freezing, swelling or cracking . . . no buckling of insulation because of ice buildup. Consequently there's no need for constant maintenance or costly periodic replacement of insulation.

THE UNIQUE COMBINATION of properties offers other cost-saving advantages, too. Rigidity and high compressive strength of Styrofoam eliminate need for reinforcement. Plaster has great adhesion to Styrofoam, permitting walls and ceiling to be finished without costly furring and lathing. And the permanent low "K" factor of Styrofoam keeps heat load on equipment low through years of service.

This unique *combination* of properties is the reason Styrofoam is so often specified as the insulating material for low temperature installations. For more information, contact your Dow distributor, or write THE DOW CHEMICAL COMPANY, Midland, Michigan, Plastics Sales Department 2221BU11



*Dow's registered trademark for its expanded polystyrene

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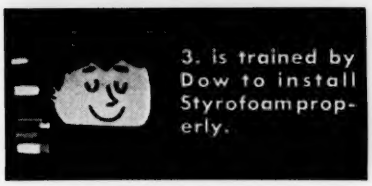
Look for this seal when you build cold storage facilities. It's displayed only by contracting firms with a record of top performance in space insulation. This seal means the contractor . . .



For the names of Approved Styrofoam Insulation Contractors in your area, write to THE DOW CHEMICAL COMPANY, Midland, Michigan, Plastics Sales Dept. C.

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DOW

news briefs—

Equipment Yardstick

▶▶ FINANCIAL PRESS, daily and monthly, have been keeping a close eye on the air conditioning and refrigeration field. Late September releases by the Air-Conditioning and Refrigeration Institute and the Industry Division, Bureau of Census, have prompted much comment in the October press.

ARI's release shows shipment of compressor bodies in 1959 thus far have been up 43 percent over 1958 figures. The Bureau of the Census publication, compares very favorably the 1958 production figures to those of 1957. As a result, FORBES magazine forecast "fair and cooler" for the industry after interviewing five subsidiaries of larger corporations, and three large independents in the field.

The ARI report did not include household refrigerators, but these and compressor bodies for automotive air conditioning continued their increase. Institute figures are based on reports of manufacturers whose output is estimated at 90 percent of U.S. production.

FACTS FOR INDUSTRY, the Bureau of Census Report, indicates that while units of air conditioning and refrigeration equipment were produced in greater numbers in 1958, the dollar value declined, indicating that the American public is receiving the product at a better manufactured unit cost.

Total product value at manufacturing level topped the billion mark. Meanwhile, the UPI was quoting government economists as predicting the gross national product of $441 billion in 1958.

The ARI survey indicated there were 212 manufacturers reporting in 1958 compared with 202 previously.

Three particular points in the report had significance for the industrial refrigeration industry. Ammonia compressors sold, were up better than 10 percent over previous reports, and in larger sizes. Evaporative condensers, however, declined in numbers sold by almost 25 percent. However, there was no way of checking this decline against sales of air cooled units. The quantity of centrifugal hermetic units sold during the year was well over 6½ times the number of open type or gear driven centrifugal machines.

Subsidiary In Control

Control of the National Ice and Cold Storage Co. of California has been taken over by U.S. Cold Storage Corp., a subsidiary of American Ice Co. The WALL STREET JOURNAL reports an agreement establishing this vertical administration, but price and terms were not announced.

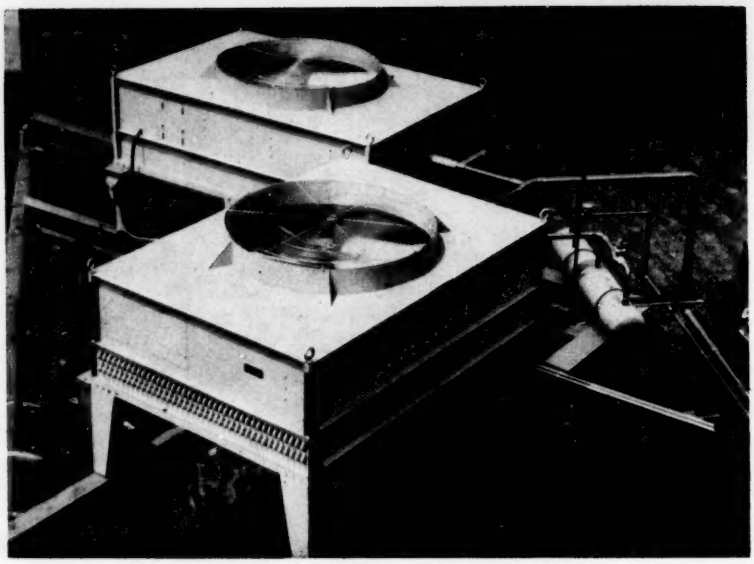
The National firm operates a dozen establishments in Central and Southern California. U. S. operates cold storage warehouses from Hopkins, Minnesota to Port Lavaca, Texas, and from Chicago to Kansas City, with plants also at Omaha, Dallas and Fort Worth. American Ice Company has headquarters in New York and has previously confined its activities to the Atlantic Seaboard.

In May, the Lithium Corporation of America, investigated American Ice Co. with regard to exercising an option it held to buy 60 percent of American Ice's outstanding stock. The option was to have expired May 31. Terms reported by the WALL STREET JOURNAL at that time indicated an option lapse would permit American to take the Lithium shares of U.S. Since that time American has also initiated a quarterly dividend on common stock which had previously been paid annually.

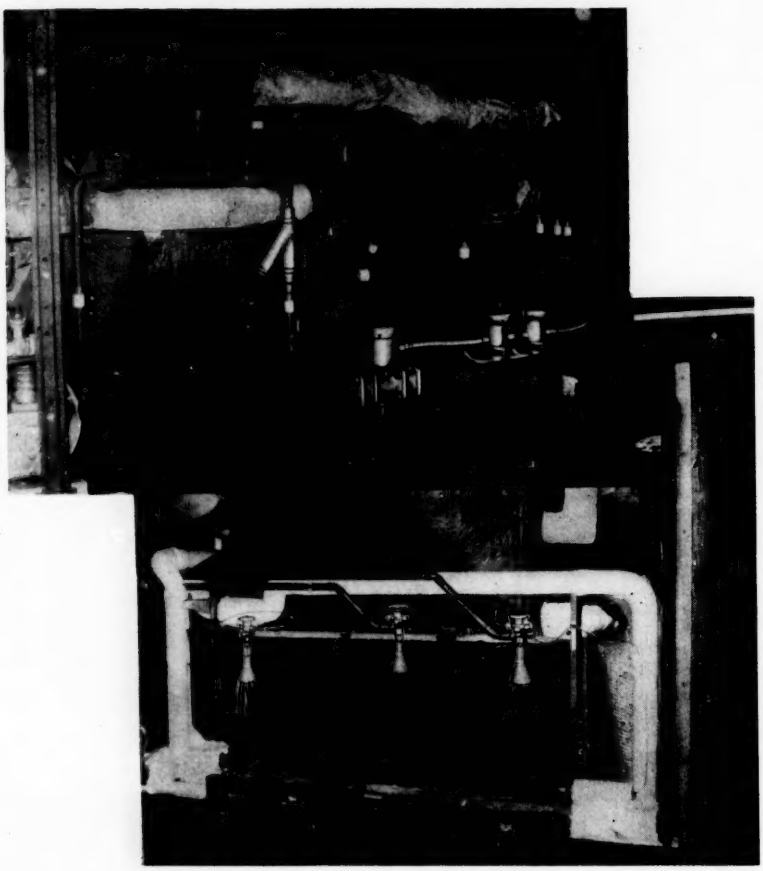
Richmond Asks Reversal

City officials at Richmond, Virginia asked the Federal Fourth Court of Appeals to reverse a jury verdict against it in the Merchants Ice & Cold Storage warehouse explosion which took place in January 1958. The city asked for a new trial as an alternative.

The three-judge court took the appeal under advisement according to the RICHMOND, VA. DISPATCH. Decision is not expected for several weeks. The city had contended the explosion was due to escaping refrigerant gas, whereas, the owner had successfully shown the explosion was caused by natural gas escaping from a broken city owned main.



Air Condensers Gain In Industrial Applications



Explosion-proof Controls Required For Missle Logistics

Vertical Flow Air Condensers

▶AIR COOLED CONDENSERS are now being applied to replace fresh water exchangers in refineries. In August the ESSO BAYONNE NEWS announced that air cooled exchangers and fans would replace its present cooling tower system. A similar single unit was also being installed at their Wax Hydro unit.

The new coolers were put in place above existing exchangers, about 15 feet above the ground and were cut in without delay the last week in August. It was a barometric condenser and associated cooling tower which was replaced.

Vertical Line Added

▶PICTURED AT LEFT are two examples of vertical flow air cooled condensers added to the line manufactured by a Zelienople, Pennsylvania manufacturer. Ranging in size from three to 100 tons, these ACV units are said to offer a host of advantages. The principal advantage suggested is the lower silhouette and architectural advantage gained by mounting the fan and coils in a horizontal position.

Upward draft results in noise being deflected away from nearby structures and the spread proportions reduced concentrated roof-loading. However, the principal engineering advantage offered is the fact that they are not affected by wind conditions as may occur with horizontal mounting.

Alco Controls for Titan

▶ATMOSPHERIC conditions required for the successful launching of the largest U. S. missile, the "Titan", are produced by a 2-stage refrigeration system controlled by Alco valves.

This complex heating and air conditioning system, developed and built by Elliott Engineering Co., Inc., Lynwood, Calif., employed *Thermo* expansion valves and *Explosion Proof* solenoid valves, *One Piece Venturi* refrigerant distributors and strainers by Alco Valve Co., in the refrigerant control systems.

Upper figure at left, shows strainer and solenoid valves, while the lower illustration pictures the expansion valves and distributors.

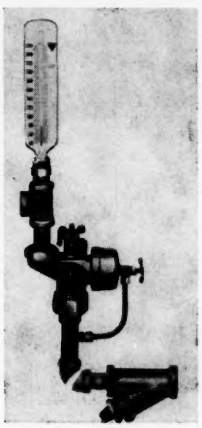
Some of the component parts of the system include: 12-cylinder compressor with 50-hp motor, and two 8-cylinder compressors connected to a 60-hp motor; a 12-ton liquid cooler and two section air-cooled condensers mounting four 47-in, 4-blade propeller fans; a 60-hp positive pressure blower designed to move 250 lbs. of air per minute against a 40-inch (water) external static pressure; an electrically fired steam generator designed to heat 175 lbs. of air per minute from minus 20 to 120 F.

More Ice-Makers, Air Condensers Introduced

Plastic Applications Expand, Germ Killing Air Filters Marketed

Water Temperature Regulating Valves

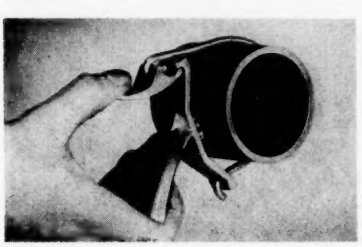
▶LOW COST water temperature regulation for any industrial cooling system is claimed by a Minneapolis manufacturer of the *Vic* Model 90 water temperature regulating valve. The valve is designed to supply only the exact amount of water required for each particular application.



Positive water temperature control is said to be achieved within 2 F. The valve is available in two models covering temperature ranges from 60 to 120 F and from 100 to 160 F. They can be used in any water cooling system with pressures up to 125 psi. Water flow is 9 gpm with a 30-lb drop. The unit comes complete with a strainer, bleeder assembly and thermometer.

Quick Clamp Spray Nozzles

▶SPRAY NOZZLES may be installed in any existing piping without costly replacement, by means of new spray nozzles introduced by Link-Belt Company. These nozzles can be used wherever a pressure spray is needed.



Pictured is the hard cast manganese bronze nozzle which employs a U-clamp and a cam to firmly lock the nozzle in place. These nozzles fit 2, 2½ and 3-in. pipe diameters.

The new spray nozzle has a machined taper on the outside of the nozzle which fits snugly into the hole which has been drilled and tapered-reamed in the pipe. Link-Belt states that the nozzle has a higher hydraulic efficiency than a plain hole in a header pipe. The clamp arrangement makes it unnecessary to replace the entire header when corrosion or wear has opened up the orifice.

New Temperature Control

▶SMALL COLD CONTROLS powered by a short-stroke bellows charged with refrigerant gases have been introduced by the appliance control department of a leading electrical manufacturer. The gas filled bellows operate against a lever and coil spring which produce rapid and accurate temperature changes according to the company engineers. The new controls are custom made to meet each original equipment manufacturers requirements and can be mounted in any position. They are rated from 60 through 90-amps for 120 to 240-volt applications.

New Type Filter Driers

▶NEW MOISTURE-LIQUID Indicator Adapter Fittings developed by a Zelienople, Pennsylvania fitting manufacturer, may be placed permanently in the refrigerant line, but the new adapter type molecular sieve filter-drier can be installed quickly by screwing the drier container onto the adapter fitting without disturbing line connections.

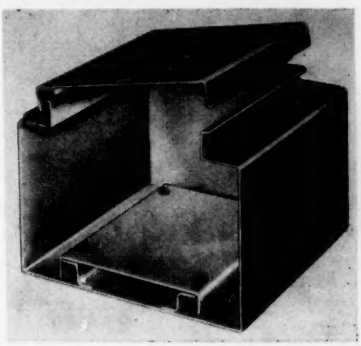
Bits Ice Makers

▶MINNESOTA maker of processed ice producers, has added two new units to their automatic ice making line. Called Crystal Tips "Bits" ice makers, these units deliver and store 120 and 360 pounds of flake ice per day. Standard with each model is a 170-lb stainless steel ice storage bin. This Minnesota manufacturer claims production of flake ice for as little as 6 cents per 100 lbs., and is recommended not only for institutional use but also for food dispensing activities at wholesale and retail levels.

Electrical Developments

▶NEW PRODUCTS for the mechanical end of refrigeration and air conditioning plants have competition for publicity on the power end. New developments in the electric and electronic field are announced with equal rapidity.

A Detroit firm recently introduced a new line of NEMA Type 12 Panel Enclosures for industrial use. This new construction features two Z-bar supports welded to the enclosure wall, which run the full height of each panel. This permits secure bolting of wired panels from the front without danger of stud shearing or stripping.



Cut-away view shows the new Z-bar panel supports (at bottom in this photo).

The new enclosures are of a rigid, all-steel construction with fully-welded leakproof seams and an all-around neoprene door gasket for maximum protection from dirt, dust, water and oil. The door gasket is held in place by a metal retaining strip. The single door wall-mounted enclosures, as well as two door floor-mounted enclosures, are available in a wide range of standard sizes.

Lithium Chloride Plant

▶FULL PRODUCTION of anhydrous lithium chloride at Henderson, Nevada, was announced in July by American Potash and Chemical Corp. The firm makes many lithium compounds, including a hydroxide for the production of multi-purpose lubricants. Anhydrous lithium chloride is also used in the manufacture of aluminum welding and brasing fluxes.

In the industrial refrigeration field the principal use of this material is in the preparation of low temperature salt baths for heat treating of metals. It is not only an excellent heat transfer medium but is said to prevent corrosion during heat treatment process. Lithium chloride solution stays liquid as low as minus 60 F which makes it useful for low temperature batteries and fire fighting. It is also utilized in air conditioning and dehumidifying.

More ▶

WHAT'S NEW, Continued: Growing Plastics

Plastic Insulations

▶PLASTIC INSULATIONS are finding more and more favor in the electrical field, as indicated in the previous paragraphs. However, their acceptance and widespread use in the thermal insulation field has been hardly less than phenomenal. Urethane is one form of plastic used for thermal insulation. However, urethane foam can be made as soft or strong as rubber or as hard as ivory, says Allan W. Cox, Director of Urethane Product Sales, Dayton, Ohio.

Formed by the precise proportioning of basic chemicals, urethane can be made flexible or rigid for an infinite number of industrial and commercial applications. As a foam, the material has excellent sound and thermal insulating qualities as well as great strength with light weight. In a cast (non-foaming), or solid form, the material has remarkable wearing qualities.

Cellulose Acetate Filters

▶NEWLY DEVELOPED air filters may also provide a major break through in a battle against the air borne bacteria in buildings. Developed by a firm known for its automotive filters, the new air filter impregnated with *Permachem* is said to destroy bacteria, including antibiotic-resistant organisms such as staphylococcus aureus, permanently and more effectively than any previous system.

Complete line of these air filters to fit all types of air conditioners is now being marketed. Advantages offered in addition to the control of pathogenic bacteria, is light weight, non-splintering, non-irritating, odorless qualities of the material which is made from cellulose acetate and then *Permachem* treated.

Fram air filters are a dry filter media formed into a loose "batt" that contains millions of dirt traps. Because the filters use no oil they eliminate the problem of cleaning duct work.

A private test corporation, following Air Filter Institute specifications, found 12 to 46 percent longer life and better dirt retention abilities.

Micro-biological assays made on experimental filter media of this firm is backed up by reports from Hazleton Laboratory tests and Francis Delafield Hospital of the Columbia Presbyterian Medical Center of New York City. The formula used on the filters is the same chemical developed to dis-infect hospitals, treat linens, laundry, furniture, etc. It is an organic tin compound.

Washable Urethane Filter

▶AIR CONDITIONERS by one Long Island manufacturer are now equipped with a washable type urethane foam filter. Although offering several advantages, most important is the fact that the owner never has to buy a new filter. When it becomes loaded with dirt, the filter may be washed in soapy water, wrung dry, and re-installed in the unit. No replacement is necessary, no spraying with oil is required.

Another advantage with the urethane filter is that the conventional size weighs slightly more than one ounce as compared with the aluminum filter which weighs 5½ ounces. The urethane material cannot be damaged in transit or in handling, and will always snap back to its original shape.

Urethane foam for these filters is the product of a diisocyanate, such as the *Nacconates* supplied by Allied Chemical's National Aniline Division, and a polyol such as polyester, polyether, or castor oil, together with other chemical ingredients. When water is added to the formulation, carbon dioxide is formed, which causes the mixture to expand to some twenty times its original volume, through the release of tiny gas bubbles, while changing from a liquid to solid state.

Material Advantages

For filtering purposes the Long Island manufacturer is using a special kind of urethane foam, *ScottFoam*. *ScottFoam* differs from conventional urethane foam in that it does not contain the thin membranes which usually enclose the gas bubbles. Without these thin membranes, the foam is a fully skeletal structure. Therefore, it offers little resistance to air-flow, a characteristic important to the engineer concerned with pressure drops across the filtering medium.

Another advantage of the skeletal structure is that the foam does not "face-load" as other filters usually do. Instead, dust, pollen, and other airborne impurities collect uniformly through the depth of the filter. In this way, the filter may be used for longer periods without cleaning, and without offering an undue obstacle to the flow of air.

Despite its unusually light weight, urethane foam is extremely strong. At Fedders, grommets are driven into four corners of the filter, which is then simply hung on four lugs near the front of their units. The foam will not tear out. It can be sewn, hog-ringed, or stapled, without fear of damage.

Plant personnel working with the foam filter appreciate the fact that it does not splinter. It does not cut hands, as metal filters might, nor is it the source of glass splinters which are annoying and hard to detect.

Trucker Test Report

▶RELEASED EARLY in August were the results of a year-long test on a 35-foot trailer which hauled meat and produce between California and Midwest points. This Omaha trucker made a test of the urethane foam insulation in his trailer, and as a result has embarked on a modernization campaign they will put this foam in his fleet of trailers.

The trucker, Lipsman Fulkerson Trucking Co. carries fresh and frozen meats, maintaining zero to minus 10 F for the frozen, and 27 to 33 F for the fresh. On the return trip, frozen or fresh products are transported at temperatures ranging from zero to minus 10 F, and plus 40 F.

Developed for Lipsman Fulkerson by the Sterling Refrigeration Engineering Co., Omaha, Nebr., the urethane-foam-insulated trailer has been operated over 160,000 miles since its construction in May 1958. Because of the excellent thermal insulation value of urethane foam using a *"Freon"* blowing agent, Sterling engineers were able to reduce the trailer wall thickness from 6 to 3 inches, increasing the interior cube and allowing for more pay load while still maintaining efficiency as a frozen food trailer.

At the end of the 142,000 mile check, no loss in insulation efficiency was noted. The insulation required no replacement or maintenance during the year, despite the rough usage of this type of service. The engineering firm has also made successful applications of foamed-in-place urethane in railroad refrigerator cars. The foaming compositions used in the application were supplied by a Lyons, Ill. firm and one of the principal ingredients was *"Hylene"* organic isocyanate.

New Truck Body Company

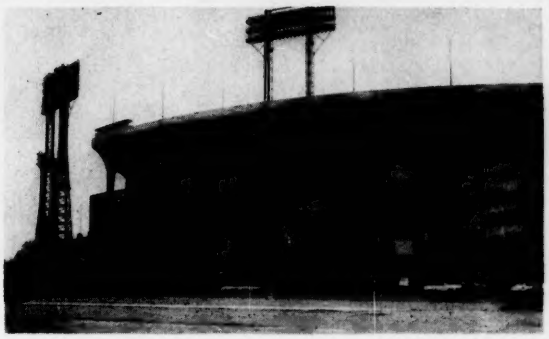
▶CANADIAN purchases of insulated and refrigerated truck bodies for milk delivery wagons, ice cream and refrigerated delivery of frozen foods, has prompted the formation of another company. F. G. Houselander, according to TORONTO FINANCIAL POST, has established the Commercial Truck Bodies Co. He was formerly with another truck body manufacturer for 25 years, where he had recently been production manager.

Icing Up

by Richard Francis

NEW MATERIALS And CONSTRUCTION INNOVATIONS

Light standards mark the four corners of the Baltimore Memorial Stadium ice skating rink — parking area, shown here with cars parked on concrete surface during a Baltimore Oriole American League ballgame.



Another view of the combination ice skating rink and parking area at Baltimore Memorial Stadium. Light standards delineate concreted rink. Access to stadium locker and rest rooms from the rink is shown in the background. —*Bethlehem Steel Co. photos*

▶▶▶ YEAR ROUND ice sport has seen an increase in popularity not only on the North American Continent, but in Europe as well, it was pointed out on these pages in October. However, it was observed that most year round installations were attainable because of permanent refrigeration and rink facilities. Also, with few exceptions, most year round installations were favored with enclosures against inclement weather.

Up and coming generations of North Americans, however, still seem to favor outdoor settings for their ice skating, hockey and other ice and snow recreations. As a result, both portable and permanent installations are "iced up" with the close of summer sports. An automobile parking lot alongside a baseball stadium has a refrigeration grid imbedded. With conclusion of the World Series, the parking lot becomes a very popular outdoor rink. In other areas, playgrounds, tennis courts and soft ball diamonds become smaller ice sheets.

World-Wide, Family Sport

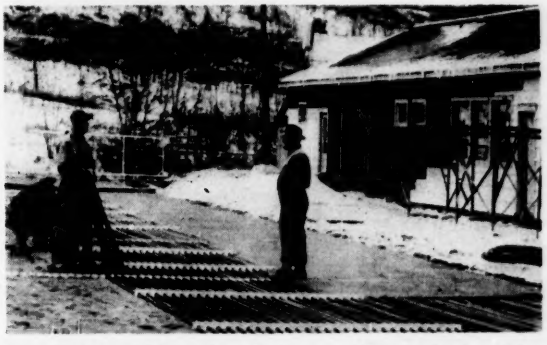
Indoor or out, these ice sports appeal to all ages and many commercial establishments are catering to the sporting desires of the whole family. In the past, manufacturers and contractors of equipment were accustomed to installations for college rinks such as the $1 million dollar McHugh Forum completed early in the year on the Boston College campus. Other rink business came primarily from organized professional enterprises.

Today, there are installations which range from a year-round indoor ice skating rink in Detroit, to an outdoor motel skating rink in New Jersey, to an artificial ice skating rink in Tyrol, Austria. The rink in Detroit, reported as the largest of its kind in the nation, built at a cost of $800,000, features special hours for housewives.

More ▶

Typical of more permanent rink installations is this pattern of brine carrying *Ammonoduct*. There is 54,000 lin. ft. of this steel pipe in the 85x185-ft. rink, plus an additional 650 ft. of 8-in. pipe and lesser lengths of assorted sizes. Note steel high-chairs supporting the grid 1½-in. off membrane, serving the purpose also of placing the refrigerating grid below but close enough to the rink surface for most effective heat transfer.

—*Bethlehem Steel Co. photo.*



So-called portable rinks which use coils of plastic tubing to form the refrigeration circuits, do not employ chairs for support or spacing. Notched spacers are placed upright at approximately 12-ft centers in the first layer of sand. Then, temporary spacers are placed at approximately 4-ft centers with notches over the tubing before placing the second layer of white sand which holds the circuits to design spacing. This rink at Washington, Pa., utilizes 10 miles of National Tube polyethylene. —*U. S. Steel photo.*

Tightening a length of Spang CW Steel pipe during construction of a new ice rink at St. Sebastian's Country Day School, Nonantum Hill, Newton, Mass. Pipe was installed by Harding and Gross, Cambridge.
—Photo by National Supply Co.

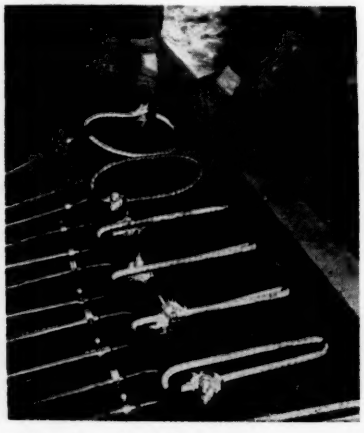
Construction practices and trade skills vary from one area of the U. S. to another in very much the same manner as material selection and rink designs. Here, lengths of steel pipe are pre-welded and placed for the field welders who tie them into the headers.
—Bethlehem Steel Co. Photo

The motel in New Jersey has adapted a variation of a 3-year old Chicago idea. The reduced winter capacity of the air conditioning system and refrigeration plant is adapted to use with the ice skating sheet. Useless space over the swimming pool during Chicago winters is employed for the rink, while the roof deck of the motel garage is used in New Jersey.

Management of the Innsbruck Fair (Tyrol) in a town well known as a sports and tourist traffic center, now has a modern artificial ice skating rink installed in their recently built hall. It is reported that the management held an opinion that Innsbruck, Austria's most important sports cener, urgently needed such an indoor skating rink.

In August, THE REFRIGERATION JOURNAL reported on the first Australian outdoor skating rink, opened in Sydney. Late in September, the New York Convention and Visitors Bureau flashed its annual announcement that the Rockefeller Center, Lower Plaza Rink, was once again in operation, making possible ice skating in Indian Summer. That Bureau goes so far as to claim that participants can come surprisingly close to suntanning while they are skating.

Connecting National Tube rink circuits to the headers and return pipes requires only a screwdriver and a simple wire clamp. Tube can be cut with a hacksaw. Thin-wall tubing is designed to help keep the cost of community ice rinks within reason.



Pairs of polyethylene tube are connected by a u-shaped return bend made of the same material. Expansion and contraction in the skating rink's plastic pipe is controlled by rubber shock cords connected to hooks on the rink rim.
—U. S. Steel Co. photos

Less Newer Materials; Improved Recent Lines

Claims of new materials made in press releases from many manufacturers appear to be improvements or refinements of post-World War II developments in the field of plastics. A waterproof membrane of polyethylene in sheets wide enough and long enough for the 85x185 regulation rink are offered.

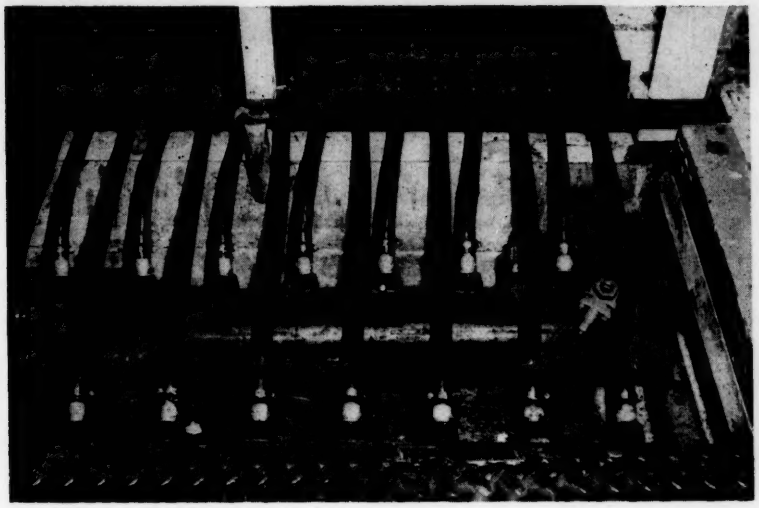
Early forms of polyethylene tubing have been improved to minimize creep or contraction which occur respectively with rise or fall in refrigerant and atmospheric temperatures. However, most of the ideas introduced in the past few years have been construction or application techniques rather than new materials.

Last year at Jesup, Iowa, a civic group established a 140x40 ft. skating rink in a public park. Winter had already set in when the decision was made and the ground was frozen. However, to minimize water losses and ground thawing they selected a polyethylene underlay. It was installed to 40 ft. width by overlapping 14 ft. wide sheets. The seams were made by heat sealing with a household iron. The edges were merely overlapped three inches, news print placed over them and the hot iron applied. The material was 4 mills in thickness (.004 in.). This more than 5,000 sq. ft. rink with frame cost $200.00.

Floors Vary Widely

Designing engineers and contractors of the more permanent installations still vary in their methods of floor construction. The same statemen holds true in connection with the portable rinks. In the latter cases, many merely place tubing or piping over a membrane and flood the surface, freezing it in several steps. Others employ a sand fill between the refrigerant grid which has the added purpose of holding the circuits on centers should any creep or contraction occur, and has other freezing and sheet maintenance advantages.

The Boston College rink previously mentioned employs a permanent type ice rink. The pipe runs are imbedded in the concrete. The finished surface is terrazzo. However, the ice can be quickly melted by use of heat exchangers and the flooring used for other indoor activities. "Down under", the Australian rink floor was really constructed ruggedly. A 6-in. concrete subfloor was poured and 7-in. of cellular concrete used over that for insulation. Over the insulation a 5-in. concrete slab was poured containing the refrigeration grid.



Close-up of brine headers and circulating hook-up at the Kalamazoo, Michigan, Ice Skating Rink. Brine pressure line is totally in view. Return main is beneath the floor plate in the foreground. Plastic pipe is slipped onto nipple connectors and held fast by stainless steel clamps. Working pressure is 35 psi. Plastic pipe and supply system requires 3,700 gals. of brine. —*U. S. Steel Co. photo.*

At Hershey, Pa., the Bears' mechanical engineers specified this arrangement for header-grid hookup. Note the valves in each circuit and the short vertical and inclined risers alternately placed. Support for the headers is provided by a length of channel iron in which rests a short piece of piping to serve as a roller beneath each header. Brine carrying pipe is wrought iron. A previous wrought iron installation in the Hershey Sports Arena served for 24 years. —*Photo by A. M. Byers Co.*

Other recent floors in the United States vary from six inches of sand-fill with two inch board-form insulation placed over, followed by 15-lb hot mopped felt; to a rink with 18-in sand-fill and 6-in concrete subfloor and a 6-in concrete finished slab. The installation employing the 2-inch board form insulation added 1½-in. pipe high-chairs placed to carry the grid, around which the 4-in. concrete finished floor was poured. In the floor employing the 18-in. sand-fill, the pipe grid was placed on top the 6-in. subfloor before the 6-in. finished floor was poured. Soils, building construction, climatic conditions and apparently some personal convictions, seem to bring about the wide variations of floor construction.

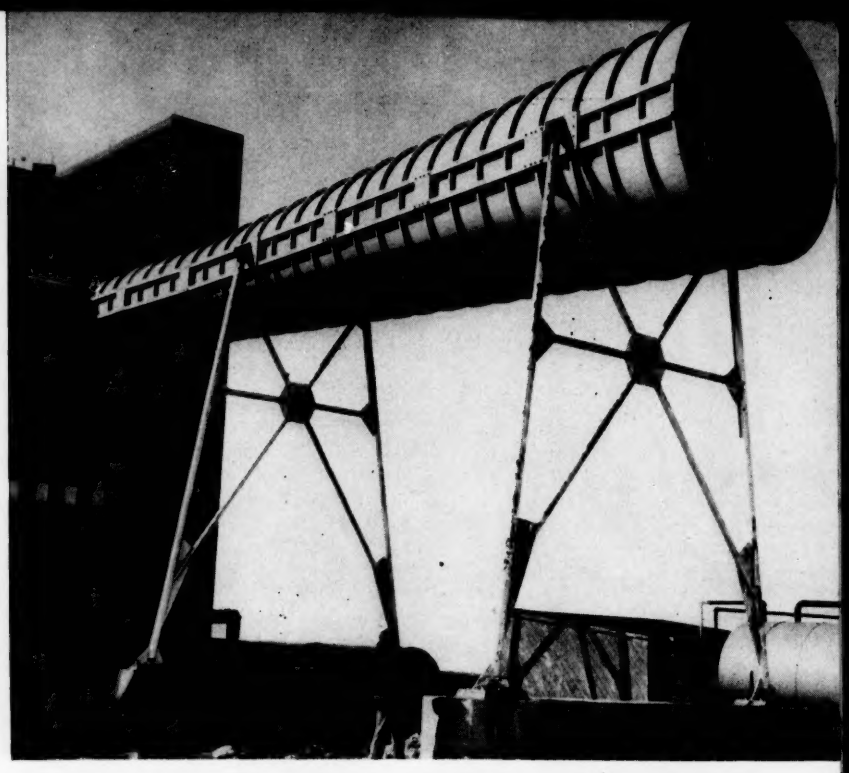
Pipe and Grid Selections

Like floor designs, the refrigeration grids themselves vary widely in material and placement. Rinks appear to average from 8 to 10 miles of pipe or tubing. The three principal materials seem to be wrought iron or steel pipe, and plastic (polyethylene) tubing. Nominal sizes of the pipe range from ¾ to 1½ inch, with one inch seemingly the most popular.

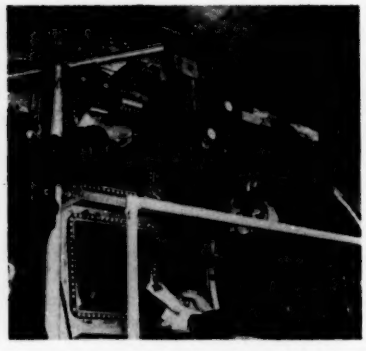
Plastic tubing appears to be standardized on the one inch with a 1.15-in. o.d. and 1.05-in., i.d. Manufacturers of this material are now claiming a 50-year service life. Improvements in the composition of this plastic material are indicated in an average of 4-in. per 100-ft. shrinkage today, as compared with 12 inches in 185 ft. ten years ago.

Polyethylene water-vapor membrane being placed for the Jesup, Iowa, Community Skating Rink. While 4-mil material was used for this rink, manufacturers are now marketing a 6-mil film available in various widths to 120-ft. Material provides a very inexpensive method of containing water for the ice sheet.

Laminating various widths and lengths of polyethylene film is easily accomplished with a domestic hand iron, a piece of newsprint and a plank as illustrated. —*Photos courtesy of Spencer Chemical Co.*



Twelve foot diameter outlet from the new ice tunnel extends more than 60 feet from the rear of the third floor of the test building. The jet engines that provide the refrigeration effect, are so loud that ear-muffs must be worn by everyone in the test area. The entire control room floats on vibration absorbent base so as to keep extremely sensitive test instruments unaffected.

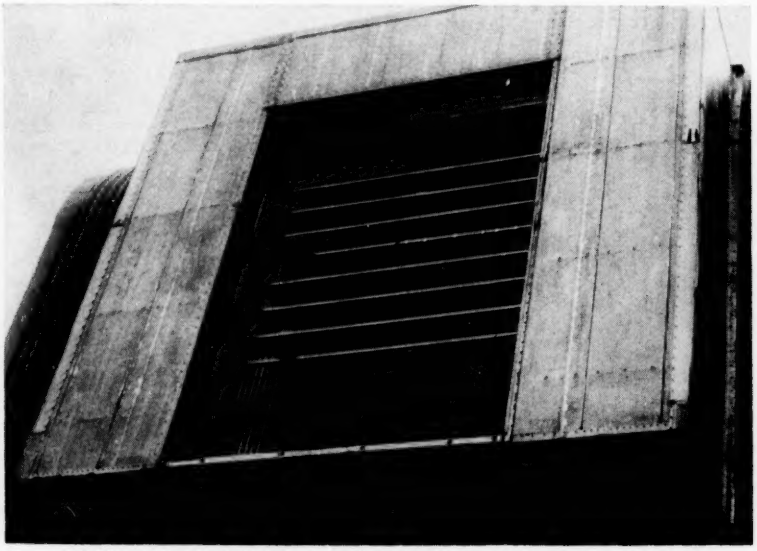


Personnel watch tests through heated glass windows on either side of test section while the movie camerman records complete visual performance.

Blast of cold moisture-laden air deposits ice on test de-icer, just as if it were mounted on a plane.

De-icer goes to work breaking up deposit under pneumatic pressure just as it would in flight.

Senior Engineer Weisend cleans de-icer after test. Arrow indicates opening where one J-57 exhaust blast is introduced. Opposite wall has inlet vent for a second J-57 exhaust. Figure at the rear is standing in the tunnel 12-ft diameter outlet.



So you think you have defrosting problems? Visualize adjusting spray heads and knocking the ice off this grid three stories above the ground. Water is sprayed into on-rushing air from this grid work at the mouth of the wind tunnel to simulate varying degrees of icing conditions. —*Photos courtesy B. F. Goodrich Co.*

Jet Refrigeration Simulates Icing Conditions

▶▶▶ ELABORATE environmental test facilities have been constructed in many parts of the country to simulate the various altitude, temperature, and other actual flight conditions for testing aircraft and missiles. However, the Air Force Development Center at Mt. Washington, N. H., utilizes a conventional industrial type building and two Pratt & Whitney J-57 engines to simulate icing conditions in a new wind tunnel.

The B. F. Goodrich Co. has used the mountain top since 1941 to test anti-icers and de-icers under in-flight conditions. The 6000-foot altitude, 75 mph winds, below-zero temperatures and 340 days of fog a year made it a natural test site.

But with the development of higher-speed, higher-altitude aircraft, the normally rugged conditions on the mountain had to be augmented.

The new 135-foot long wind tunnel can simulate speeds of over 500 mph (Mach. 8 at the 6000-foot altitude), and can supply icing conditions independent of outside weather. It has been called the highest-speed icing wind tunnel of its size in the United States—perhaps in the world.

Not TR, or hp, but— Two-Jet-Power

The speed is supplied by two Pratt & Whitney J-57 jet engines, the same type as used on the B-52 Stratofortress and the F-100 Super-Sabre.

The exhaust gases of the 13,000-pound thrust engines are funneled into the tunnel through ports cut in the walls about 30 feet beyond the tunnel's test area.

The tremendous volume of exhaust gas blasting through the tunnel sucks in outside air. The faster the engines run, the faster the air is sucked in.

At the tunnel's entrance is a gridwork of pipes which spray water into the inrushing air, forming ice on the test item. The amount of water may be varied, so any icing conditions can be adjusted.

Aircraft-type windows are installed in the tunnel walls so test engineers can watch their projects in action. The windows are electrically heated to keep them ice-free during testing.

B. F. Goodrich was the first company to use the new airfoil (wing) section in testing. The item tested was a pneumatic deicing unit being developed for use on the extremely thin, razor-edged wings being used on the latest high-subsonic aircraft.

Instrument Recorded

Batteries of instruments constantly record data during the "test flight." Norbert Weisend, senior product engineer, Aviation Products, ran the tests, while Andy Koloniar, B. F. Goodrich photographer, recorded the session on film. More tests on the pneumatic unit are scheduled for late this year, both for development and to qualify the equipment for Air Force use.

Calls Liquid Hydrogen Coming Space Propellant

▶▶ INTERVIEWED by a DENVER POST staff writer, Tom Gittings, Jr., an atomic physicist at Los Alamos, New Mexico, was quoted late in August on the use of hydrogen as a space ship propellant. "Liquid hydrogen is emphatically the coming propellant for atomic powered missiles and spaceships", he said. Recent Nevada tests with such rocket engines were very successful.

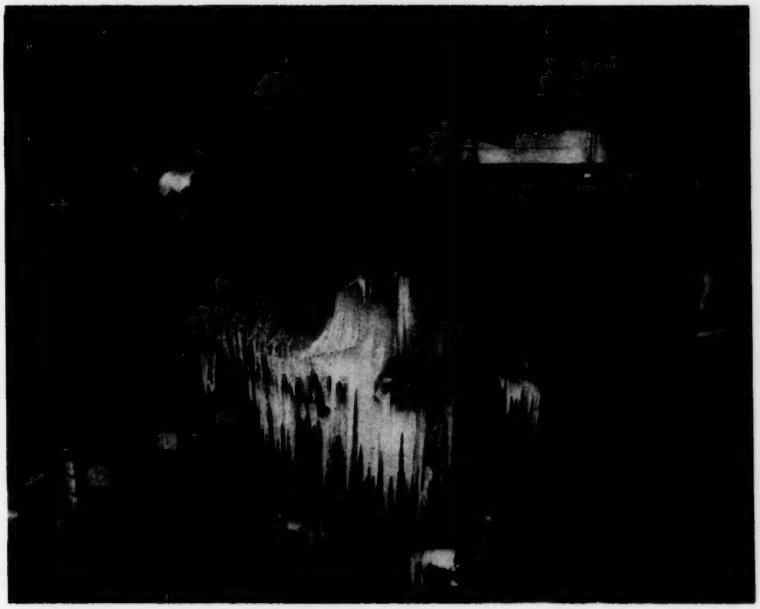
Basically the object is to heat hydrogen gas to the highest temperature possible with modern reactor techniques. The hydrogen expands enormously, rushing out the rocket nozzles to create thrust.

Not Used As Fuel

Hydrogen is not the fuel in this instance although it is a conventional rocket fuel. Fissionable material is the fuel for the atomic-powered space vehicle.

For space applications, liquid is preferred to gaseous hydrogen. Gittings credited the Cryogenic Engineering Laboratory, NBS, for the break-through in processing the ultra-cold liquid. Use of liquid over gaseous hydrogen cuts storage costs by 90 percent.

Ice Test For English Plastic Missile



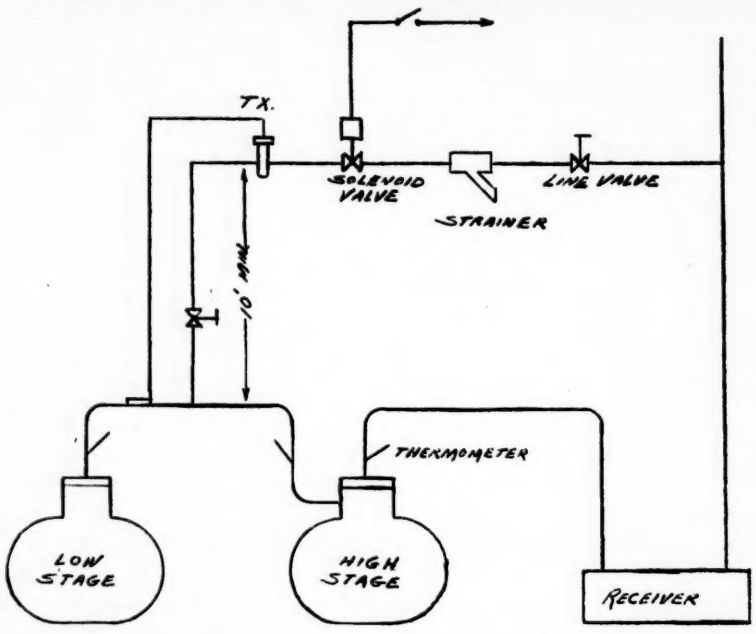
Undergoing an icing treatment as one phase of extreme low temperature tests is a British *Thunderbird* missile. This version is a plastic of reinforced polyester.
—Universal Trade Press Syndicate Photo

NAPRE QUESTION BOX

H. P. Hayes

HAVE A QUESTION? Address it to Prof. Harold P. Hayes, Dean of Engineering, State Polytechnic College, San Luis Obispo, Calif. Answers appear monthly in this department on problems forwarded by NAPRE members. Comments from all readers welcomed.

Operating Troubles With Compressor Valves



QUESTION: During the past season we had more valve troubles than in any previous year. We are using the compressor manufacturer's own valves in compressors and boosters.

At first we had trouble with the center rivet breaking, but now the manufacturer has overcome that problem. According to them, it had something to do with improper temper of the rivets. Now our trouble seems to be with sudden changes in gas temperatures. —C.S. and R.V.P., Pa.

ANSWER No. 2: An accurate answer to your problem of valve plate failure is difficult on the basis of the information furnished. Basic causes of valve failure must be eliminated first. These failures are (1) liquid or oil slug (2) high head pressure, and or non-condensables.

According to the question, the problem is operational failures rather than defective valve material. Therefore the problem is brought down to the following three possibilities, (1) high head pressures, (2) non-condensables and (3) excess superheat when running the low stage. The first two can be solved by normal plant maintenance or the addition of an automatic purger if required.

The solving of excess superheat on multi-stage equipment requires the addition of a liquid sub-cooler. A sub-cooler with a capacity of 10 percent of the high stage should be large enough for operation temperatures down to minus 40 F.

Liquid De-superheating

This would be an expensive addition for tonnage equipment, so the following stop gap measure is suggested: Tap the liquid line at the most convenient location and pipe as shown in the sketch. The following action takes place. The TX feeler bulb senses superheat changes from the low stage, permitting a small amount of liquid to flow into the line. This cools the gas discharging into the high stage, thus lowering the resultant superheat. The solenoid valve (see sketch) must be interlocked with the low stage and a toggle switch is suggested for service.

Thermometers should be installed on the low stage discharge, high stage suction, and the high stage discharge. The TX valve must have an external equalizer and external superheat adjustment. Care must be taken that the high stage does not flood. Adjust the TX valve so that the high stage superheat stays under 140 F at the lowest control temperature.

Note that the solenoid valve can be wired temporarily to a separate source of power and controlled manually by the toggle switch.

—Alex J. Cox, Pittsburgh.

Editorial Note: Answer No. 1 to this question which appeared in the May 1959 issue suggested that this subject might prove an interesting panel for a future NAPRE convention. Professor Dick Zach, chairman of the annual meeting education program, took that suggestion. The first presentation on December 9 at New Orleans will be a panel on compressor valves. Three major valve and compressor manufacturers are represented.—**JRK.**

Seeks Thermoelectric Refrigeration Literature

QUESTION: Where is literature available on Thermoelectric Refrigeration?
—F.D.S., St. Pete, Fla.

ANSWER: One of the best articles to date on the subject of Thermoelectric Refrigeration was presented by Mr. L. A. Staebler at the Philadelphia Section, ASHRAE, April 3, 1959. His paper, "A Primer of Thermoelectric Refrigeration" was published in the August 1959 issue of the ASHRAE JOURNAL. You may obtain a copy (75¢ payable with order) from their editorial offices:

Circulation Manager,
ASHRAE JOURNAL
234—5th Avenue
New York 1, N. Y.

—J.R.K., Chgo., Ill.

International Refrigeration

REPORTS ON COPENHAGEN CONGRESS

▶▶▶TENTH CONGRESS OR REFRIGERATION sponsored by the International Institute of Refrigeration at Copenhagen, Denmark, 19-26 August, 1959, had over 250 papers presented to the Nine Commissions of the Institute. Danish hosts to the meeting instituted a gold medal in commemoration of the first practical quick freezing method which will be awarded every fourth year at the International Congresses.

A selection of five tours was made available to Congress participants and a manufacturing firm of international reputation printed up brief booklets in French and English which pictured salient features and described refrigeration facilities in a number of plants visited by the five groups. Distribution of papers received by the Institute began in late September with the publication and circulation of the different speeches made at the opening and closing ceremonies.

Only unfortunate event in the whole Congress was the inability of the President, Dr. R. E. Griffiths of the United Kingdom to attend. Dr. Griffiths was reported in ill health and unable to attend the Congress but sent a welcoming message.

In his message President Griffiths pointed out that participants in the Congress came from 43 countries and from an area covering 65 percent of the surface of the world. He expressed the gratitude of the Institute to His Majesty, the King of Denmark who had consented to be the Patron of the Congress, to the Danish Government; to the City of Copenhagen and to the Danish Organizing staff.

Reminded Daily of Refrigeration's Significance

Minister of State H. C. Hansen addressed the opening of the Congress and extended the customary welcome. "Living in an agricultural country whose industry is also expanding rapidly," Dr. Hansen said, "one cannot help being reminded daily of the great scope and significance of refrigeration. To an audience like this I shall, of course, not go into the details of these technical matters, but I would like to mention that refrigeration in Denmark led to a fruitful development of the engineering trade at a very early stage. Already about 1890 the production of refrigerating machines and complete refrigerating plants were taken up in this country".

"Refrigeration is an industry of great importance to Denmark, and for Danish agriculture and fishery the introduction of refrigeration proved to be very important in our efforts to increase productivity.

Developments by Research

"Refrigeration techniques have also helped to even our seasonal fluctuations in international trade in perishable products, thereby opening up new markets also for Danish exports. We hope and expect that as and when home refrigerators and, eventually, deep-freezers become more common, we will get corresponding increases in the number of consumers of our agricultural products.

"The progress achieved in the frozen foodstuffs industry is a fine example of the creative power of research, not least when it is based on intimate international collaboration.

"Research and education are centered on the universities and colleges. However, private organizations also contribute to research in Denmark. For instance in agriculture, most of the research in breeding, feeding, slaughtering, canning, etc. is carried on by research centers, etc. which are owned and operated by the farmers themselves. I believe that this extensive participation by the individual producers has made the engineering and foodstuffs industries of Denmark not only competitive, but even pioneers in various fields."

The Ottesen Medal

Danish Organizers of this Congress decided that the Ottesen medal should be awarded every fourth year in connection with the International Congress of Refrigeration. It shall be awarded to a person who has done outstanding work in the science or technique of refrigeration as determined by the field work of the International Institute of Refrigeration.

Professor Rudolf Plank of Karlsruhe, Germany, reviewed the life of A. J. A. Ottesen. Ottesen was born in Denmark in 1860, the son of a fish exporter. He later directed this enterprise independently. His aim was to improve the quality of fish and to preserve its fresh state as long as possible. At 51 years of age he invented his quick freezing process.

"Ottesen was not only in possession of a biological instinct, but of a high technical ability as well," said Dr. Plank. "He was aware that fish frozen in cold air was deficient in quality and that the long freezing time was commercially unprofitable. No appreciable advantage could be reached by applying lower air temperatures. Real success could only be reached by increasing the freezing speed 20 or 30 times. Thus, fish was to be frozen in a medium of much higher thermal conductivity than air.

Immersion Freezing

"Freezing of meat and other perishable articles by immersing into brine with or without a covering was already recommended in a patent application of Everhard Hesketh and Alexander Mariet both in London in 1889. Freezing fish in mixtures of ice and common salt was applied in the eighties and nineties of the past century by Inspector Wallem in Norway and was later improved by Henrik Bull and Nikolai Dahl in Trondheim However, these processes had an inherent disadvantage: salt from the concentrated solution penetrated into the fish body and influenced adversely the taste and keeping capacity.

"In 1911 Ottesen applied for a Norwegian patent which was granted to him in 1913. His basic idea was to freeze fish in an unsaturated solution, which was to be cooled down to its own freezing point. A solution of this kind has no tendency to give up salt to the surroundings and to become even more diluted. On the contrary it tends to separate ice and to increase its salt concentration. Thus, no salt would penetrate into fish immersed in such a solution, the osmotic activity being at its minimum.

(Continued on Page 22)

"Butcher Boy"

Since 1885

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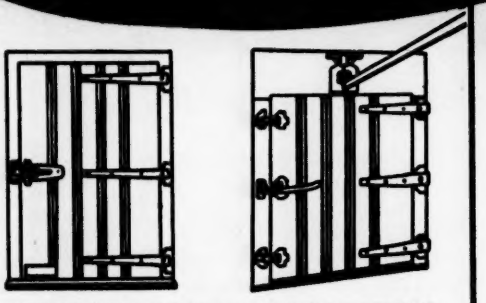
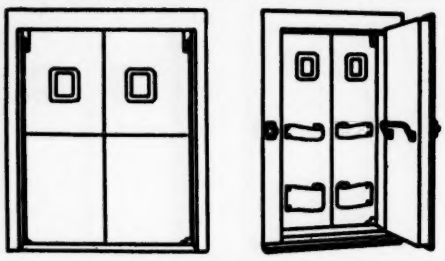
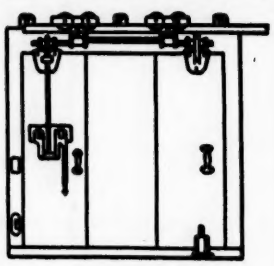


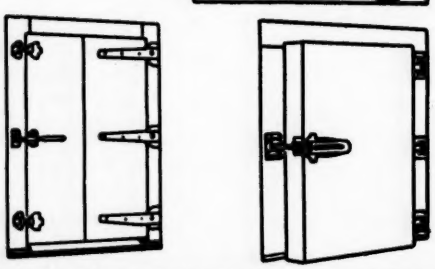
STANDARD COOLER-FREEZER DOORS



STANDARD VESTIBULE AND AUTO-CLOSE DOORS

HORIZONTAL SLIDING DOORS (Manual)





LOW TEMPERATURE INFITTING and OVERLAP

AUTOMATIC ELECTRIC DEFROSTERS WITH THERMOSTAT CONTROL

CATALOGS AVAILABLE UPON REQUEST

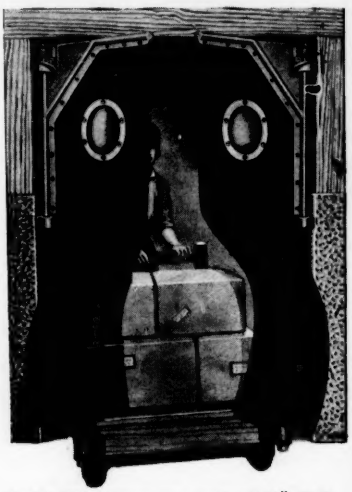
FLEXIBLE RUBBER BATTEN DOORS INCLUDING STANDARD DOOR FRAME at no extra cost!

TYPE "TSH" WITH SEMI-HEIGHT MOUNTINGS

Especially adaptable for smaller door openings.

THEY PERMIT

1. Safe passage of hand or power operated equipment with wider pallet loads.
2. Corner cutting with hand and power trucks.
3. Repeated abuse from impact of trucks at minimum damage and maintenance costs.



Model TSH battens are made of ¼" thick Neoprene (no grain) or of ¼" tough specially compounded rubber, reinforced with 2 layers of heavy cotton duck. Materials remain flexible even at extremely low temperatures.

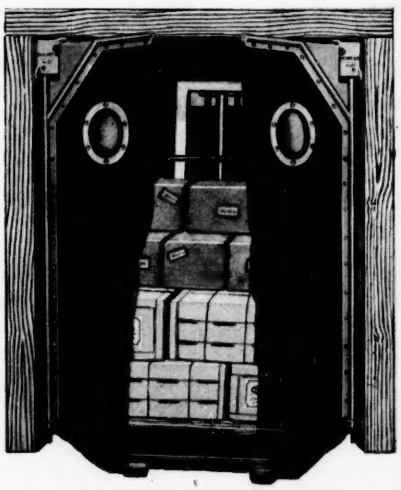
Model TSH battens are furnished with No. 12 gauge galvanized steel jamb guards applied 4' 0" high with *no protrusions into the clear door opening.*

TYPE "FH" WITH FULL HEIGHT MOUNTINGS

Designed for wider and "straight traffic" doorways.

ADVANTAGES

1. Loss of refrigeration is held to a minimum.
2. Extra rigidity — tighter doorways.
3. Eliminates exposure and drafts near loading docks or at other openings.
4. Flexibility of battens permits repeated abuse and shock of mobile equipment contacts.
5. Permits movement of trucks and pallets at high speed in and out of refrigerated or other storage areas.



Model FH battens are made of ¼" thick Neoprene (no grain) or of ¼" tough specially compounded rubber, reinforced with 2 layers of heavy cotton duck. Materials remain flexible even at extremely low temperatures, and will not tear under most severe conditions.

BUTCHER BOY REFRIGERATO

1000 BUTCHER BOY DRIVE

REFRIGERATOR DOORS

Electro SAFETY-SLIDE HORIZONTAL DOORS

FEATURING STRUCTURAL SIMPLICITY

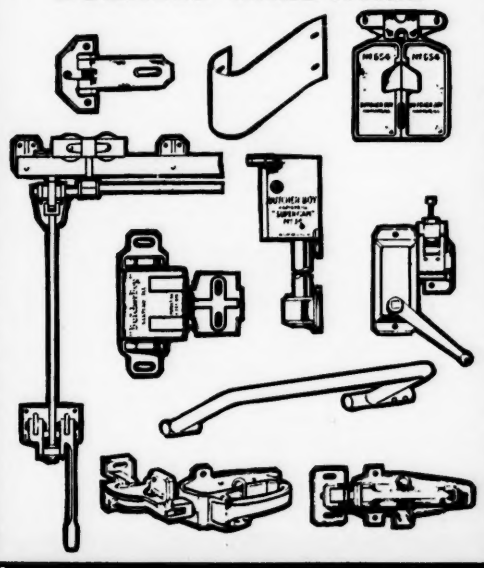
- **MECHANICALLY SOUND**
- **COMBINED "SPEED AND SAFETY"**
- **EXCLUSIVE AUTOMATIC SEALING "Gasket Assembly"**
- **SIMPLIFIED INSTALLATION**

Bi-Parting Horizontal Sliding Doors Available. CAUTION: Not recommended for use in cooler or freezer areas. Bi-Parting double horizontal sliding doors, of necessity, require gasket seals where the doors meet at the center of the opening. Hence, gaskets must be applied at "vulnerable" areas, exposed to contact by trucks or other objects which will rip or tear the gaskets, thereby destroying the necessary seal between the doors. *Field experience dictates this precaution against the use of bi-parting sliding doors.*

14 OUTSTANDING FEATURES

1 Overhead chain drive.
2 COMPACT—Electric Power Operator Assembly.
3 Heavy malleable iron Hanger Brackets.
4 Hyatt roller bearing Door Bracket.
5 Manual "Safety Release".
6 Automatic Sealing Assembly.
7 Automatic Electric Defrosters.
8 Concealed electric systems.
9 Safety Edge.
10 Complete Frame metal clad.
11 Special "SEAL" and "SILL" gaskets.
12 Defroster Drain Outlet.
13 Manual "Interior Safety Release".
14 "Roller-Type" Floor Wedges.

DURABLE HARDWARE



DOOR CO., Dept. "IR"
HARVARD, ILLINOIS

10th International Congress

(Continued from Page 19)

"There is no doubt that Ottesen first clearly demonstrated the advantages of a high speed of freezing with regard to the quality of the frozen products and to the economic operation of a freezing plant. He gave the initial impulse to the development of the Quick Freezing Industry of today and to its general recognition. His name must be preserved in the history of refrigeration as that of a real pioneer in the field of food preservation and of an honest fighter for the realization of his ideas," concluded Plank.

Prime Minister Hansen presented the first Ottesen medal to Dr. J. C. Fidler, Ditton Laboratory, Maidstone, Kent, United Kingdom. Responding to the presentation, Dr. Fidler, following his acceptance remark, addressed the Congress on the technical and scientific work of the Institute. His paper was a brief history of the Institute and its accomplishments, and concluded with some remarks on how the delegates could get the maximum benefit from the Congress.

Closing Remarks

Among the speakers closing the Congress were Professor Dr. Rudolf Plank, who gave the farewell address in both French and English; Professor C. J. Gorter, Honorary President, IIR, who expressed the thanks on behalf of the delegates; and R. Thevenot, Director of the Institute, gave the summary of achievements.

Congress Papers

Having a geographical advantage, the United Kingdom and Continental trade press have begun publication of summaries of some of the more than 250 papers presented. Those prepared by U. S. delegates or commission representatives who captured the fancy of publications abroad, include Professor Carl F. Kayan who reported an "Investigation of the Controlling Effect of Surface Variables on the Rate of Cooling of a Solid Body; and Dr. M. C. Brockmann who reported on "Time Requirements for Processing Freeze Dehydrated Foods".

By comparison, four papers of the U.S.S.R. contingent have been repeatedly mentioned in the European publications. One dealt with the designing of large oxygen plants; another with the investigation and application of freeze-drying of foods; another with the spoilage of chilled protein food products; and, the operation of mechanical refrigerated railway trains in Russia. An equal number of iron curtain or satellite nations seemed to attract the attention of the press abroad.

This is not to imply that the Russian sphere of influence dominated the Congress. Norway and Germany seemed to be tied in popularity or interest shown in the papers submitted. One publication selected six papers from each to summarize. Denmark made a very excellent accounting of itself, as did the United Kingdom. France and Canada also received numerous mentions in these reporting activities.

U. S. Representatives

Delegates from the U. S., all members of the U. S. National Committee, were: Dr. R. C. Jordan, Head, Department of Mechanical Engineering, University of Minnesota; Mr. J. E. Dube, President, Alco Valve Company; Dr. W. T. Pentzer, Chief, Biological Sciences Branch, Marketing Research Division, Agricultural Marketing Service, U. S. Department of Agriculture; Dr. F. G. Brickwedde, Dean, College of Chemistry and Physics, Pennsylvania State University; Dr. C. F. Kayan, Executive Officer, Mechanical Engineering Department, Columbia University; and Mr. B. H. Jennings, Director, Research Laboratory, American Society of Heating, Refrigerating and Air-Conditioning Engineers.

The membership of the U. S. National Committee, consisting of twenty individuals selected from academic, governmental, and industrial institutions, is appointed by President Dr. Detlev W. Bronk, National Academy of Sciences to effect participation for the Academy as a "national member" of the International Institute of Refrigeration. The chairman of the U. S. National Committee is Dr. R. C. Jordan; Mr. John E. Dube is the vice-chairman, and Dr. W. T. Pentzer is the secretary.

First Paper Circulated

First circulation of a paper presented at the 10th Congress of Refrigeration was through courtesy of the Danish Meat Research Institute. It is "The Role of Refrigeration in the World's Food Supply" by Mogens Jul, Director of the Institute, which is located at Roskilde, Denmark. The director opens his remarks by pointing out that the greater part of all refrigeration installations are assumed to be used for processing, transportation and storage of foods. He reminded the delegates that that was not necessarily correct.

Using the United States as a sample, he pointed out that 66 percent of all refrigerating machinery manufactured here, is used for non-food purposes; 40 percent being used for air conditioning alone. For the rest of the world, however, food industry is still the largest user of refrigeration and the use of refrigeration in the food preservation will develop at a very rapid pace in the years to come.

Predicts More Applications For Food and Domestics

Outlining the need for refrigeration during processing and storage, he went on to point out the increased need for refrigerated transportation of food, and summed up for his audience the trends in modern food distribution. This paper also dealt with humidifying problems, the effect of refrigerating on cost and on taste, and concluded with a look at the food of the future.

While most American readers will be amused, there is more reality than fiction in Director Mogens Jul's predictions. It is not unreasonable, he said, to predict that the food supply of the world of tomorrow will be based on many completely ready-to-eat types of food. This has already been attained for products such as orange juice, ice cream, etc. The ready-to-eat refrigerated or frozen dinner is so far only a small factor in the total food supply, but it is likely to gain in importance rapidly.

Refrigerated Prepared Foods To Eliminate Home Kitchens

Some may find it a bit exaggerated to say that the kitchen may be obsolete in the future home. Anyone following the latest developments in the home designs in the U.S.A. will, however, realize that this is not far from being a reality. The director, himself, recently visited an American family living in a two-room apartment. It had a large, well equipped bathroom, a bed-room, a very comfortable living room, and a porch. There was no kitchen, however.

Yet, the family had three meals a day at home. There was simply a kitchen unit installed in the living room, conveniently placed and very efficiently arranged. The small amount of food preparation required in the modern home can easily be carried out in such a unit and with no discomfort to anyone in the living room.

It is not unlikely that the kitchen of today may, sometime in the future, be looked at with the same amount of curiosity as that with which we observe museum items for churning butter or brewing beer in the homes of yesterday.

Field Excursions

Congress delegates making the tours or excursions to Danish plants that utilize refrigerating systems, were treated to 6x9-in. two-color, 4, 6, and 8 page brochures, describing each installation. Printed in English and French, and distributed through the courtesy of Danfoss Manufacturing Co. of Nordborg, the brochures described briefly the principal purpose of the enterprise, the refrigerating plant and refrigerated facilities.

Excursion No. 1 consisted of plant visits to a brewery, cold store, dairy, margarine factory and a cannery. The Carlsberg Brewery in Copenhagen, utilizes stainless steel, direct expansion coils in the fermenting tanks. Low pressure floats supply liquid refrigerant and evaporative pressure is kept at the desired value by means of constant pressure valves in the suction line.

The cold store visited was at Copenhagen, one of ten such installations built by the Danish Cold Stores Concern between 1940 and 1950. The dairy, margarine factory and cannery were also at Copenhagen. The Solbjerg dairy was the first in Denmark to adopt the method of cooling milk by freshwater instead of brine.

Vegetable Oil Processor

At the margarine factory it was observed that the new plant, completed in 1958, was placed side by side with the oldest margarine plant in Denmark. The plant produces 3½ tons of margarine per hour, thus far. It has provision for production expansion to nearly ten tons.

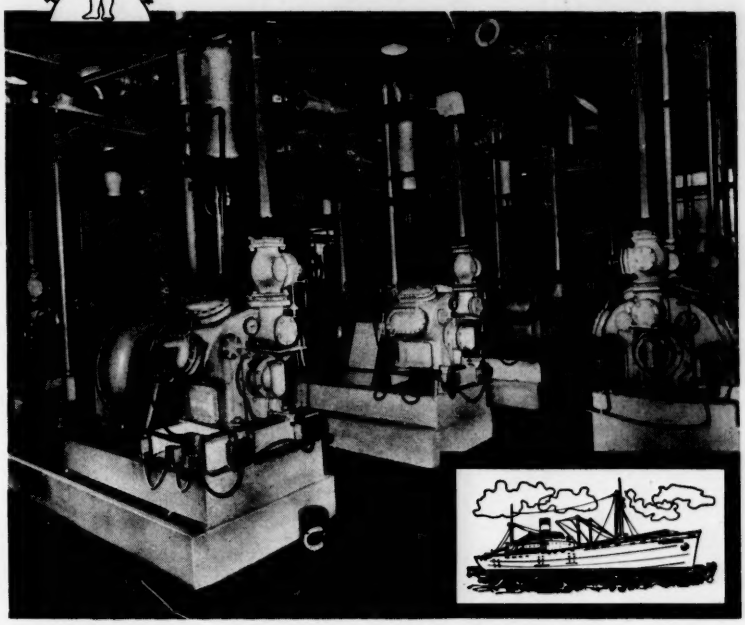
Most Common Refrigerant: NH_3

The cannery produces canned meat for home consumption as well as for export, with a capacity of about 300 tons per week, corresponding to 3/4 million tins per week in sizes from 2 oz. to 11 pounds. The refrigerating plant is used primarily for storing of raw meat products in both cold stores and freezing rooms.

All the plants visited in the Copenhagen area used ammonia as the refrigerant. A number of installations employ evaporative condensers. Engineering spaces were conspicuous with their tile walls and floors, and meticulous housekeeping.

Breakfast orange juice fresh from Florida, thanks to Vilter

Tropicana Products—world's largest producer of chilled citrus and fruit juices.



View of Vilter VMC compressors installed in the Tropicana Products Plant at Port Canaveral, Florida. Inset shows the S.S. Tropicana which carries 1,500,000 gallons of chilled orange juice every eight days between Port Canaveral and New York.

The high consumer acceptance of Tropicana's orange juice is the result of a special processing and storing method. This makes possible the year-'round delivery of chilled full-flavored, vitamin-rich, orange juice over Tropicana's entire marketing area.

One key to their success is the reliable refrigeration supplied by Vilter for cooling and processing fresh juices at their various plants. Vilter equipment, at Port Canaveral, for instance, includes 16 VMC compressors, and Vilter ammonia liquid intercoolers and ethylene glycol chillers. The entire Vilter refrigeration system functions smoothly and efficiently to handle Tropicana's large daily requirements of many thousands of gallons. Refrigerated storage facilities hold 3,000,000 gallons at Port Canaveral.

The dependable operation and efficient performance of Vilter VMC compressors is the result of continuing engineering improvements: protection against refrigerant slugs, built-in capacity reduction, precision manufacturing and factory-run-in tests.

For help with your refrigeration problem, why not call on your nearest Vilter Distributor?

Sold and installed by Vilter Distributor, W. L. Filbert, Miami, Florida

Vilter® refrigeration air conditioning

Air Units • Ammonia and Freon Compressors • Booster Compressors Baudelot Coolers • Water and Brine Coolers • Blast Freezers Evaporative and Shell and Tube Condensers • Pipe Coils Valves and Fittings • Pakice and Polarflake Ice machines.

Write for Bulletin 817 to The Vilter Manufacturing Company, Dept. J-901 2217 South First Street Milwaukee 7, Wisconsin

Practical Engineers Open 50th Year Celebration

Roy T. Burns

R. E. Zach

H. P. Hayes

G. R. King

Frank L. Chase

Panel Discussion on Compressor Valves Opens Annual NAPRE Meet in Louisiana

By FRANK L. CHASE
Educational Director

▶▶▶COMPRESSOR VALVE FAILURES in refrigerating machines prompted the NAPRE National Educational Committee to give much emphasis to this topic at a national meeting. Scheduled prominently in the meeting to be held at New Orleans, December 9, 10 and 11 is a panel discussion headed up by Richard E. Zach, refrigeration instructor, University of Wisconsin.

Zach, who is an assistant educational chairman for the National Association of Practical Refrigerating Engineers, released the program on November 2. There are a total of five educational sessions featuring 10 presentations or panels, a feature field trip and some invitational sidelights to education for those members and delegates who will attend the meeting at the Roosevelt Hotel.

Featured panelists for the compressor discussion include Joseph Raufeisen, Bell and Gossett Co., Chicago, Van L. Sparks, Ball Valve Co., Kansas City, Kans. and E. D. Lindsley, Worthington Corp., Harrison, N. J. Each panelist will discuss the design and development of a particular type valve gear for reciprocating machines, with added emphasis on proper operation of the machine and the system in which it is placed.

The NAPRE Board of Directors will meet on Monday, December 7, to review the 1959 accomplishments and to plan their 1960 activities. It will be the 50th anniversary of the Association in 1960, and the meeting in New Orleans will kick-off a year's celebration.

Organized In 1910

The preliminary organization of Practical Refrigerating Engineers had been affected by a number of enterprising operators at Texarkana, Texas, January 10, 1910 when a provisional association was organized. The practical, or Refrigerating Engineers of America, organized a national association from the provisional group on December 1, 2 and 3, 1910, when they held their first annual convention in Simon's Hall, Shreveport, La. From the 58 members present at that meeting, the association has grown with the industrial refrigeration field.

Advance Board Meeting

President Roy T. Burns initiated the early board meeting this year in order to get the Association business out of the way before the national meeting of the membership opens on Wednesday, December 9. Burns had contended for a number of years that concurrent board and committee meetings, detracted from the educational program. National Educational Director, Frank L. Chase, agreed in that thinking and as a result the NAPRE educational committee headed by Dean Harold P. Hayes, Prof. Guy R. King and Instructor Zach will present an educational program without competition.

To Introduce More Industrial Members

New Industrial Members to be introduced to the NAPRE members at the annual meeting this year will include: Anderson Chemical Co., Macon, Georgia, Owens-Corning Fiberglas Corp., Toledo, Ohio and York Corp. Div., York, Pa. Representing Anderson will be J. W. Anderson, President. W. J. Lemasters is the *Fiberglas* representative and W. H. Divine, York Subsidiary of Borg Warner Corp. will represent that new Industrial Member. Seven more sustaining industrial members will participate in the NAPRE program.

California Proceeds On Conference

NAPRE Southwestern Meeting, Feb. 28-29

▶▶TAKING THE LEAD in regional conference planning is California Chapter No. 2, under the leadership of Larry H. Benedict. Nationally, four regional sub-divisions of the NAPRE are expected to hold major educational conferences in the Spring, 1960, as part of an all-year 50th anniversary celebration. Los Angeles will host such a meeting on Feb. 28-29.

Theme of the meet will be an adaptation of the Association's motto—Morality, Competency, Efficiency—to the erection, operation, maintenance and supervision of the property given over to the practical engineer's charge. (The meeting at New Orleans will consider changing the word "Morality" to "Integrity".)

Committee Meeting Held

South Pasadena, the Old Virginia Restaurant, was the setting for the S.W. Conference planning session held on Oct. 14. It was decided that the Los Angeles Terminal Club would be the site for the Conference. Educational Chairman for the event is Regis Gubser, Vice-Pres., California Consumers Corp., assisted by Ed L. Nelson, District Engr., Union Ice Co.

Other committee chairmen are: Frank Muzzy, Hotel and Reservations; Art Bender, Bender Machine & Engine Co. Ladies Committee: Ralph Moore, Cal. Consumers, Finance and Geo. N. Paulich, a National Director, entertainment. Phil De Santis, Adohr Milk Co. is Conference Vice-Chairman and Don Byl, Union Ice Co. is Secretary.

Other chapters designating committee representatives were: Calif. No. 1, San Francisco—R. F. McKee, Pacific Fruit Express; California No. 5, Colton—Frank J. Sherer, National Ice and Cold Storage Co.; California No. 3, Sacramento—M. C. Gerhardt, P.F.E. and Wm. Nichols, National Ice & Cold Storage Co. Denver, Colo. and four other California chapters are to be represented.

Maintenance topics scheduled include the Replacing or Repairing of Pipe Mains; Refrigerant, Water, Brine Service and Maintenance of Air Conditioning Systems, packaged and remote topics are indicated. Maintenance and Emergency Repairs for Various Types of Pumps will be another topic, as well as Preventive Maintenance on Electric Motors, Controls and Wiring.

Northwest at Portland

▶VETERANS of four regional meetings, the Northwest Educational Conference recently decided on Portland, Ore. for that area's spring meet. The newly reorganized chapter there will be host. Details to be announced soon.

Annual Meeting Program, December 1959, New Orleans

Wednesday, December 9

Registration
Opening, Equipment Displays

New Equipment Presentation
by Industrial Members

First Business Session
Presiding, **Roy T. Burns,** President

Introduction of Local Figures by Chapter President **Max Sofer,** La. No. 2, NAPRE

Invocation by **Rev. Carl J. Schutten,** Pastor, St. James Major Church

Welcome by **Glenn P. Clasen,** Acting Major of New Orleans

First Educational Session:
Panel Discussion on Compressor Valves
Presiding – **Richard E. Zach,**
Convention Education Chairman

Joseph Raufeisen, Bell & Gossett Co.
Van L. Sparks, Ball Valve Co.
E. D. Lindsley, Worthington Corp.

Second Educational Session:
Presiding – **S. Milton Rambo,**
NE Regional Vice President, NAPRE

Jacketed Freezer Rooms
J. W. Slavin, Tech. Lab.,
U. S. Bureau of Comm'l. Fisheries

Control of Oil in Refrigeration Systems
Joseph R. Chamberlain
James R. Harnish
York Division, Borg-Warner Corp.

Sludge Analysis in a Refrigeration System
Wally M. Smith,
General Chemical Division

New Equipment Presentation
by Industrial Members

Thursday, December 10

New Equipment Presentation
by Industrial Members

Third Educational Session
Presiding – **Falconer Anderson**
NW Regional Vice President, NAPRE

Design and Construction of New Plant Facilities in Brewing Industries
O. I. Powell, Carling Brewing Co.

Lithium Bromide Absorption Systems
Richard E. Zach, University of Wisconsin

Chapter Clinic

Field Trip –
New Orleans Cold Storage Co.*

Educational Dividends:
Special invitations have been extended to NAPRE Delegates to visit:
Delgrade Trade School
Marvin Thames, Director

New Orleans $25 Million Civic Center
Specific Plants:
City Hall
Public Library
Civic Courts Building

*For a description see page 30.

Friday, December 11

New Equipment Presentation
by Industrial Members

Fourth Educational Session
Presiding – **John N. Mariakis**
SE Regional Vice President, NAPRE

Handling and Freezing of Shrimp For Frozen Food Storage
Dr. E. A. Fieger, Dept. of Biochemistry
Louisiana State University, Baton Rouge

Central Station Air Conditioning Systems, Present & Future, **William H. Russell,**
Weil & Moses Consultants

Second Business Session

Fifth Educational Session
Presiding – **Mort E. Bell,**
SW Regional Vice President

Safety–As Natural, As Vital as Breathing
Raymond C. Ellis, Jr., Senior Engineer
Industrial Dept., National Safety Council

Modern Operating Engineer: A Technician
Guy R. King, Refrigeration Instructor,
Santa Monica Jr. College, Calif.

Final Business Session

ADJOURNMENT

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LING EVAPORATOR PRESSURE
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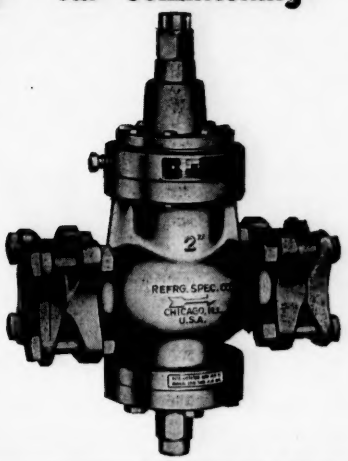
FAST ACTING



AVAILABLE CONNECTIONS ODS	FPT	Welding	Port Size	Tons @ 40° F. R-12	R-22	Ammonia
⅞, 1⅛, 1⅜	¾, ½	¾, ½	¾	2.0	2.7	7.0
1⅛, 1⅜, 1⅝	1	1	1	3.8	4.9	11.0
1⅜, 1⅝, 2⅛	1¼	1¼	1¼	6.0	7.8	20.0
1⅝, 2⅛, 2⅝	1½, 2	1½, 2	1⅝	10.7	14.0	36.0
2⅛, 2⅝	2	2	2	17.4	24.0	50.0
2⅝, 3⅛	2½	2½	2½	30.0	35.0	70.0
3⅛, 3⅝	3, 2½	3	3	44.0	60.0	140.0
4⅛	4	4	4	85.0	115.0	250.0

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Advancing Technology Demands Manpower Upgrading

Boss' Expectations of the Modern Refrigeration Engineer

By W. R. WOOLRICH
Consulting Dean of Engineering
University of Texas, and
President Consultant
Middle East University
Ankara, Turkey

▶▶▶FIRST EVIDENCE of a group concern in the development of the engineering profession for civil life, is perceived in a meeting at London, in 1771, when John Smeaton called together 65 men with engineering interest. Of this number, only 15 were said to qualify as men of professional engineering stature. In addition to Smeaton, these included Joseph Whitworth, Joseph Priestley, Mathew Bolton and James Watt.

The records show this first engineering society was dominated by Smeaton; and when, in 1792, some of the younger members of his group challenged his leadership, Smeaton's personal hurt was so intense that he disbanded what had become known as the "Smeatonions." In 1793, a new organization was assembled in London with many of the same members who had made up the disbanded group. It took the name of The Society of Civil Engineers. Recorded: "It was conceived it would be a better plan that the members should dine together at a late hour, . . . and pass the evening in that species of conversation which provokes the communication of knowledge more readily than it can be obtained by private study or from books alone."

For fifteen years after the formal organization of the Institution of Civil Engineers, there were discussions in both Great Britain and North America about the possibilities of a system of formal professional engineering education. France had had some success in instituting specialized science and engineering schools. Military colleges patterned after the French system had been set up on both sides of the Atlantic Ocean.

Modern Refrigeration Engineer: — A TECHNICIAN

▶ Manpower upgrading theme developed by Dean Woolrich at the NAPRE Annual Meeting held in Miami, Florida in 1958, will be expanded upon by Professor Guy R. King, author of *Basic Refrigeration*, at the 1959 meeting of NAPRE. The headline above is the title to King's paper. For additional convention details see the NAPRE Meeting Program on page 25. Professor R. E. Zach, University of Wisconsin, announces the program details.

In the United States, Norwich University and Rensselaer Polytechnic Institute next took the initiative and offered work in Civil Engineering. In the meantime, King's College, London, appointed a Professor of Civil Engineering and in 1838 had a recognized curriculum for Civil engineers—thus establishing its claim to being the first University in Great Britain to offer and follow through an engineering curriculum.

Non-Professional Leadership

But note that the industrial revolution period was brought about by men who did not have any University education in either applied science or engineering. Even the fifteen considered professional engineers amongst the sixty-five men in the original Smeatonions of Great Britain, including Watt, Bolton, Priestley, and Whitworth, received their technical education primarily by reading and apprenticeship. The newly formed engineering societies brought to their membership an opportunity of education by association, but it was over fifty years after the Smeatonions were organized before any formal engineering education was available in either Great Britain or North America.

Manpower Teams Required

Now the US is faced with a new type of competitive civilization in Communist Russia and China that would promote science and engineering accomplishment as the principal goal of life. In forty years, they have advanced their science and engineering from the educational right of a most limited few to the required participation of thousands.

If the United States is to keep its place as world leader of scientific and engineering achievement in design and production, with its manpower teams made up of scientific researchers, engineering designers, technical maintenance operators and tradesmen, international competition demands that all groups of this team be upgraded in both the know why and know how of industrial and scientific production, operation, and management. It is highly important that these manpower teams should be individually educated for their tasks and through their voluntary cooperation, accomplish their goal of par-excellence more effectively than the directed men behind the Iron and Bamboo Curtains.

Position of Practical Men

In the facet of this world contest we call the recognized refrigeration industry, the members of NAPRE constitute entrusted men holding key positions. It is upon men of their technological education that actual turning of the wheels of production must depend. As the entire manpower team of refrigeration revolves around these key men of production, operation and maintenance, they in turn must experience more education and training in the advanced technology of the hour, as must the other team groups.

Personal Experience Cited

Every erection operating and maintenance engineer, plus their supervisors, has been caught up in this advancing tide of technological change. The Author's own experiences illustrate such changes. My first apprenticeship was served as a power engineer, primarily as a Corliss engine operator and a horizontal return-tubular boiler fireman and maintenance steam fitter. In 1905 and 1906 these Corliss units were the most modern technologically advanced transformers of power available.

Steam turbines and water-tube boilers were confined to a few model power stations of the United States. As a Corliss engine operator, I envisioned myself in the front row of power plant progress, especially as a plant engineer in such applications as municipal power stations, city pumping plants and the refrigeration and ice making installations.

By 1910, I was employed as a cub maintenance engineer in the model power station of the United States—Quarry Street Station of Chicago. Here were the six largest vertical steam turbines and the highest efficiency water-tube boilers on the American Continent. The steam turbines were reported in the power journals as a triumph of American leadership in producing 18,000 kw direct turbine driven generators. They hastened to explain that no horizontal unit could ever be manufactured for such high speeds and weights because of the spring of the mainshaft when held horizontally. And five years later this theory was proven a myth.

Changing Refrigeration Times

By 1923, as a consultant in mechanical engineering in Tennessee, I directed the installation of electric driven ammonia plants for ice making and cold storage, and the equipping of turbo-generator power plants for textile mills; and, in each case found it necessary to junk the Corliss engine units with the newly developed acetylene cutting torch. My Corliss engine adoration and my early vocation pride were wounded by the sacrilege of destroying such a well-designed machine. But I owned no museum for their preservation.

W. R. Woolrich

At mid-year, as Vice President, Commission on Education, International Institute of Refrigeration, Dean Woolrich reported in Paris on the education of refrigeration engineers and technologists in the US. In his report, he pointed out the opportunities opened up in America by the activities of the American Society of Heating Refrigeration and Air Conditioning Engineers, and the National Association of Practical Refrigerating Engineers, by promoting night school instruction, correspondence school instruction and graduate and terminal instruction in Universities and Junior Colleges, in refrigeration sciences.

Our national economy has now been raised to the point that the forty or forty-five hour week has replaced the 84 hour pattern. The full mechanization and electrification of our plants has raised the economic life of the refrigeration operators and maintenance engineers, from laborers to technologists with incomes commensurate with the greater responsibilities they now assume.

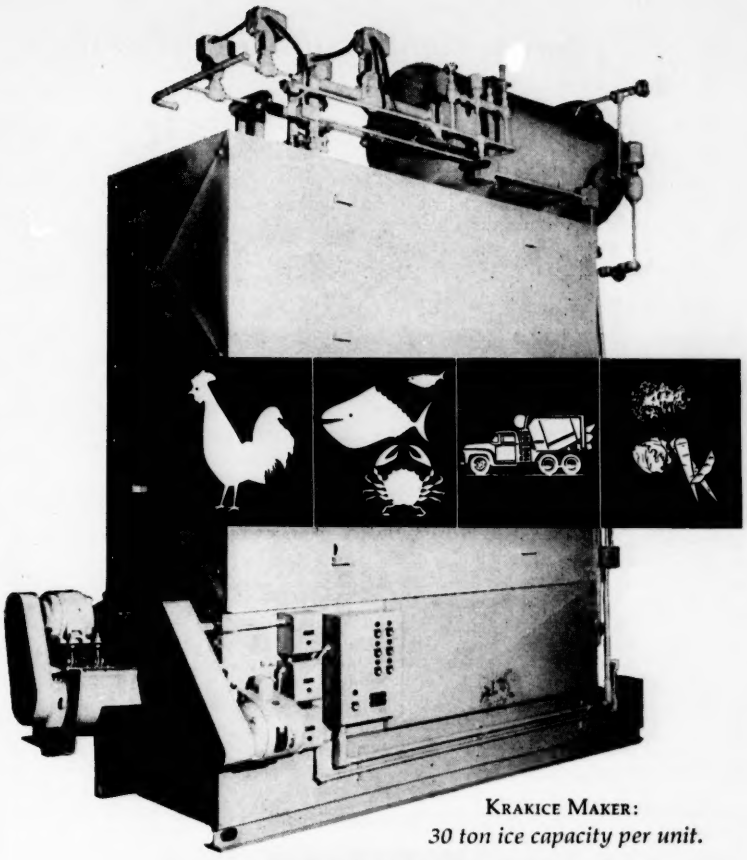
Pro- To Practical Ratio: 1 to 4

Before American Engineers lies a road for each which continues up-grading. Predicted 1959 shortage of professional engineers and scientists is placed at 15,000—the difference between 55,000 places and 40,000 newly trained men from the engineering colleges.

In American industry it averages to require four technologically trained men for each added professional engineer or scientist. Thus, *a shortage impending of 15000 men of professional grade indicates a deficiency of 60,000 technologists operating and maintenance personnel with competence by training and experience.*

As the engineering and scientific graduate is required to have a far higher level of scientific education than was demanded in each of the succeeding decades past, we can rest assured that with the rapid advance of nuclear power, electronic brains, and chemical development, the operating and maintenance engineers in all fields will be required to continue to up-grade themselves for the more exacting jobs ahead. Let NAPRE members not kid themselves that on account of these shortages, they improve their competence or not. That philosophy is wishful thinking. If a member does not measure up, an alert

(Continued on Page 28)



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When quality and dependability count... contact Kohlenberger!

Kohlenberger services include:
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Refrigerant Handling and First Aid

By FRED HERR

▶▶SAFETY and fire prevention programs advocated by NAPRE were exemplified at Los Angeles when a 2-part program was presented featuring George Roewe of "Freon" Products Div. and J. M. Clark, Ansul Chemical Corp.

An introduction to the California program was carried in the October INDUSTRIAL REFRIGERATION. In this issue, cylinder handling and first aid procedures are detailed, plus some comment on the effectiveness of 2-man fire-fighting teams.

Cylinder Handling Rules

Roewe offered the NAPRE engineers the following rules for handling fluorinated hydrocarbon cylinders:

Never heat a cylinder to a temperature higher than 125F.

Never apply direct flame or live steam directly to a cylinder or valve.

Do not fill cylinders except with the consent of the owner and then only in accordance with the regulations of the ICC.

Do not remove or change the numbers or marks stamped on the cylinder.

Never use a lifting magnet nor a sling (rope or chain) when handling cylinders. A crane may be used when a safe cradle or platform is provided to hold the cylinders.

Never use cylinders for rollers, supports or for any purpose other than to carry the specified refrigerant product.

Protect containers from any object that will produce a cut or other abrasion in the surface of the metal.

Never tamper with the safety devices in valves or containers.

Never attempt to repair or alter containers or valves.

Never force connections that do not fit. Make sure that the threads or regulators or other auxiliary equipment are the same as on container valve outlets.

Keep valves tightly closed, and keep valve caps and hoods in place when containers are not in use.

After removing the valve cap, slightly open the valve an instant to clear openings of particles of dust or dirt before using the refrigerant.

Storage of containers under a roof is recommended to protect them against extremes of weather.

Never store refrigerant containers near highly inflammable substances, such as oil, gasoline or waste, or in buildings with a definite fire hazard. Keep sparks and flames away.

When in doubt about the proper handling of the containers, consult the supplier.

First Aid Procedure

Roewe offered the Los Angeles NAPRE members some suggestions for first aid treatment in the event the liquefied gas came into contact with eyes, skin or be breathed in.

Eyes, he said, should be washed out thoroughly with water for at least 15 minutes, followed at once by the services of an eye specialist.

Should the gas come into contact with the skin, Mr. Roewe said the injury will be similar to frost bite and should be treated as such.

Should a workman be overcome in a space which lacks oxygen because of high concentration of fluorinated hydrocarbon gases being present, he should be removed at once to a noncontaminated atmosphere. The rescuer, he warned, should not enter the contaminated area unless he is adequately protected by a self-contained air or oxygen respirator. The unconscious person should be given artificial respiration manually or by a suitable inhalator. He recommended back-pressure arm-lift procedure as the most efficient method of manual artificial respiration.

Refrigeration Boss' Expectations

boss will employ some brilliant young chap from some of the lower paid fields and by speeding up his educational process with night school and NAPRE fundamental training courses, get himself a man who is ready to take the heavier assignments.

In the international picture, the work of NAPRE's Educational Committee in directing their Educational Program within the scope of the Association, is unique. It has a counterpart in Great Britain within the jurisdiction of the Institute of Mechanical Engineers, but not within the authority of the refrigeration engineers themselves. The fine work of the NAPRE presents a successful program of upgrading technological refrigeration education that is strictly American in its design and promotion.

As Author of this presentation, I am constrained to emphasize that at the rapid pace of advancement of the American technology in refrigeration and air conditioning, those who do not grasp the opportunities offered by such agencies as NAPRE for self-advancement, will lose out in the competitive race indigenous to a free society and a free enterprise system.

Personnel Handling

Complementary to the increased demands for trained refrigeration men is the higher requirement for the technological personnel of this industry to exhibit more brains and less muscle power, more mathematics and fewer pipe wrenches, more creative thinkers and less shovel heavers, and above all more managers of up-coming young men and fewer bosses of unreasonable philosophy.

The combined refrigeration and air cooling industry now ranks well within the ten largest business enterprises in the US. As this industry prepares to expand several hundred percent into irradiated refrigerated foods, very low temperature process refrigeration, automobile air cooling, the production of petro-chemicals, and highly selective surgical refrigerated operations on human beings, competence of men thoroughly educated and trained in the science, operation, and maintenance of machines for producing cold is a national must.

The Author predicts that the National Association of Practical Refrigerating Engineers twenty-five years hence will have advanced to surprising new heights if it will engrave its objectives in the hearts and minds and the physical well being of the younger members, to the point of decisive action to learn fundamentals of refrigeration and with an inquiring mind participate in the operation, maintenance, and field design of plants for the production of cold.

Advocates 25-yr Program

It is even recommended that in the not too distant future, this Association should constitute living past presidents of the NAPRE as a planning committee for the development of programs for the next quarter century. The retiring president, fresh from the problems of his administration, could well become the Chairman of the committee for each succeeding year. If NAPRE should follow this route, it can anticipate great advancement by the Association in the pattern of one of America's fastest expanding industrial achievements.

From Know-How, To Know Why

The first English speaking engineering society was made up of technical men, most of whom were trained in the **know-how** and a few who had the spirit of research and had endeavored to determine the **know-why.** By its very nature NAPRE will always be made up of this same admixture, and it is well that it should remain so.

However, in the last analysis, every member who has advanced to the level of the **know-why** on the basis of his study and experience, should consider himself a pre-empted member of the Educational Committee and make it his business to assist younger members to advance also to the **know-why** level. That is true education and that is the greatest contribution each member can make to the Association specifically and to the Nation in general.

Hazard Potentials Noted

Roewe confined his discussion to cylinders used as shipping containers for fluorinated hydrocarbons. "Commercial 'Freon' Products", Mr. Roewe explained, "are liquefied compressed gases with atmospheric boiling points ranging from minus 41 to 118 F. Since most of these materials are shipped under pressure," he emphasized, "it is important that the containers be carefully manufactured, loaded, tested and handled. Cooperation of all who handle and use these containers is essential in preventing possible hazard to the user or damage to the container."

As refrigerants, the speaker revealed, halogens have been in use for up to 27 years. He warned that a cylinder of this gas has the inherent destructive power of dynamite if mishandled in storage, movement or use; or if a refrigerant cylinder is hooked up to a refrigeration system containing a refrigerant of different type hydrocarbon.

Cites ICC Regulations

Roewe hammered strongly on the point of proper attention to the pressure of a cylinder. He declared that it is literally a question of life or death to the plant employee if he applies pressure to a Freon cylinder higher than the pressure specified for it by the manufacturer or filler.

The speaker discussed regulations governing containers. He explained that the manufacture, testing, filling and shipment in interstate transportation of compressed gas containers is regulated by the Interstate Commerce Commission. (Refrigeration men interested in obtaining copies of the regulations, ICC Tariff No. 10, will find them available at a nominal charge by writing to H. A. Campbell, agent, 30 Vesey Street, New York 7, N. Y.) He told the Los Angeles refrigeration group that, for the purpose of the ICC regulations, a non-flammable compressed gas is defined as non-flammable material, having an absolute pressure greater than 40 psi at 70 F, or an absolute pressure greater than 104 psi at 130 F, or both.

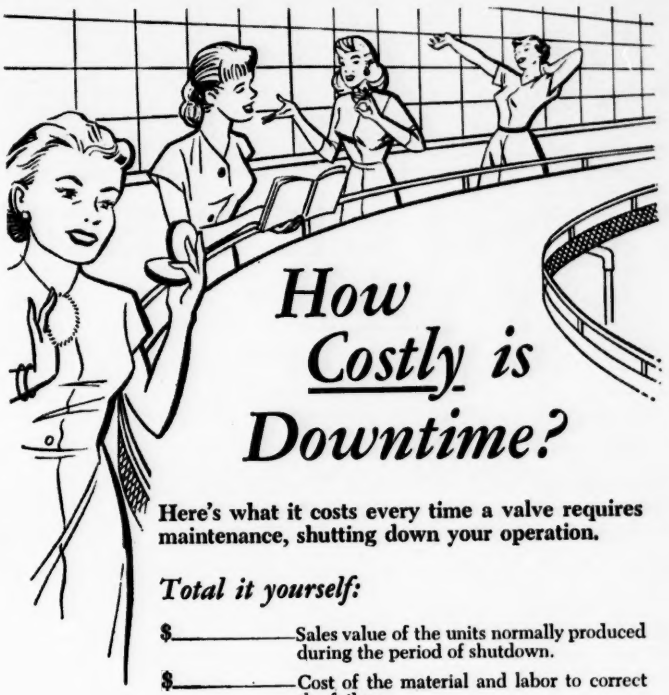
With graphs on illustrated slides he presented various statistical facts about "Freon" gas cylinders with which refrigeration plant engineers should be acquainted: minimum water weight in lbs; outside diameter of cylinder, and overall length, including hood cap; approximate tare weight; and, net weight of containers in pounds.

Two-Man Teams Effective

In this general commentary, Clark declared that some fires are "two man" fires. He cited, as an example, a truck fire with 200 gals of gasoline spilled around the vehicle. At least a 1000-lb extinguisher should be used, he advised. Each of the men should take extinguisher hoselines and approach the fire from upwind.

Then they should begin discharging dry chemicals into the near edge of the fire, then split to take opposite sides, pushing the flames back to the downwind side. They must, he warned, reach all flames and get around metal obstacles to be successful. When the flames are out, they should stand by ready for flashbacks until the metal has cooled below the ignition point of the gasoline.

While gasoline truck fires are not a common hazard around refrigeration or central station air conditioning plants, Clark pointed out, the technique of two-man fire fighting could apply in many of its essentials to fires that may confront refrigeration plant operators.



How Costly is Downtime?

Here's what it costs every time a valve requires maintenance, shutting down your operation.

Total it yourself:

$_____ Sales value of the units normally produced during the period of shutdown.

$_____ Cost of the material and labor to correct the failure.

$_____ Idle time while operators wait for repair or work reassignment.

$_____ Added cost of supervision to "get back into production".

$_____ Cost of overhead and utilities which continue although production has stopped.

$ *Your Total Downtime Cost.*

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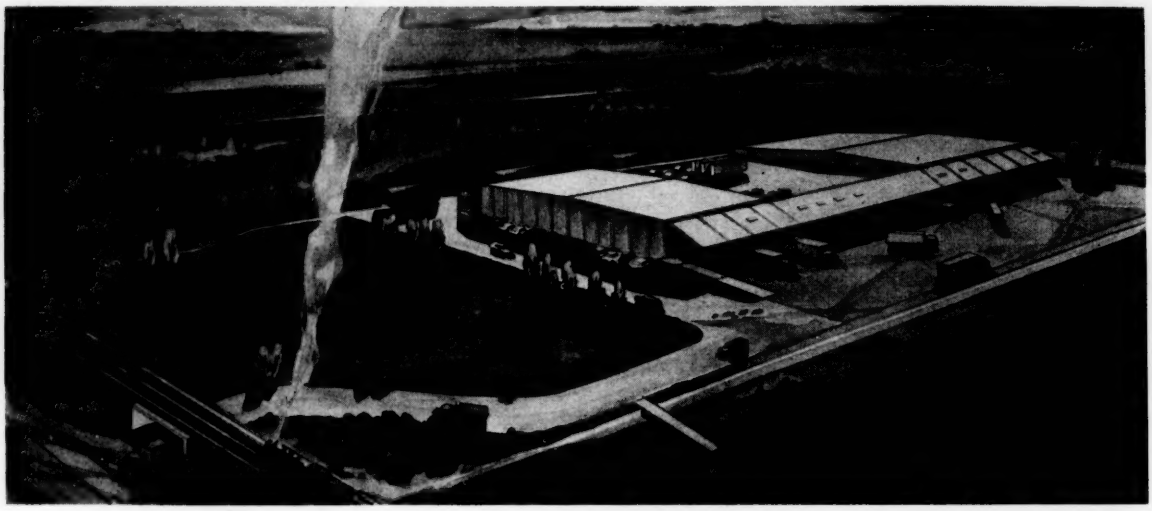


MODERN FOOD DISTRIBUTION WAREHOUSE

▶▶▶ NEWEST MILESTONE in the Crescent City's refrigerated warehousing progress, is the Airline Highway plant of the New Orleans Cold Storage & Warehouse Co., Ltd., placed in operation in July 1957. Delegates and members attending the annual meeting of the National Association of Practical Refrigerating Engineers, Inc. will tour the 1,300,000 cu. ft. processing, freezing and storage plant refrigerated by a two-stage, liquid NH_3 recirculating system.

Supervisors, maintenance crafts, operating engineers and erection trades represented in the NAPRE educational meet, will have reviewed for them, the principal functions of the public refrigerated warehouse and its contribution to the health and welfare of the community. H. L. "Jimmy" Brooks, President and General Manager for New Orleans Cold Storage will also emphasize roles of all departments in such an enterprise, showing the engineers how their contribution of effort stacks up with product handling, accounting and sales.

One-Story Structure

Placed more than three feet off the ground, the warehouse rests on piling and caissons which reduce frost heaving risk considerably. Treated lumber was used for the piling, the bumper guards throughout the structure, the door bucks and for insulation anchors where required. The treatment is a salt pressure process which penetrates through the lumber rather than a surface treatment.

The rectangular structure is arranged with the larger and higher refrigerated rooms at each of the shorter sides. The administrative offices, tenant spaces and engine room are located in the center, the other two long sides being utilized for rail and truck platforms.

Construction is of concrete with *Fiberglas* insulation in the floor, wall, partitions and on the roof. The insulation thickness is uniform so that the 12 refrigerated compartments could be easily convertible from high to low temperature storage.

Transportation Access

Product by rail moves into (or out of, occasionally) this food distribution center by means of a 15-car varying-level enclosed dock. Since refrigerated railroad cars are not all the same sill height, the car dock is ramped from 42 to 59 inches.

Similarly the truck dock is graded from 42 to 56 inches from the cooler storages at one end, to freezer rooms at the other. Produce trucks generally have a lower bed than the over-the-road frozen food semi-trailer. A 12-ft. overhang is provided on the truck dock for protection against inclement weather, and a 75 ft. apron provides easy access.

Sliding Cold Storage Doors

Inside the docks, on the truck side, the width is 26 ft. and 22 ft. wide on the rail side. Horizontal sliding doors are utilized on these docks, each equipped with a heater strip to prevent condensation and freezing. Butcher Boy equipment is thru-out the plant. Doors and insulation were supplied and installed by Reilly-Benton Co., an NAPRE Industrial Member, and Al F. Lusch Insulations, Inc.

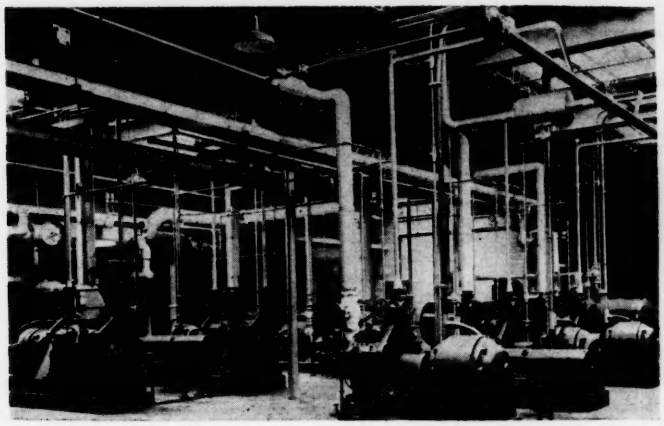
Palletized Operations

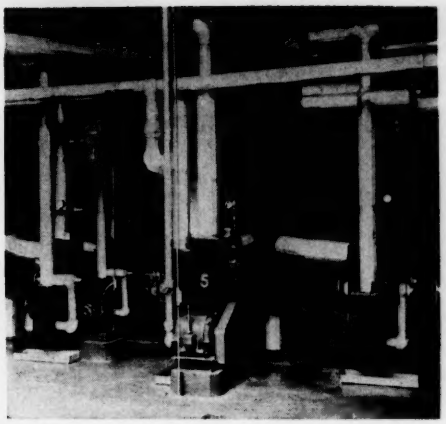
For rapid handling of the product, the operation at New Orleans Cold Storage is completely palletized. Pull cords are provided on the cold storage door pneumatic operators at a distance sufficiently removed that the lift never stops when moving perishables to or from refrigerated areas. There is an 18 ft. clear stacking height in all but four of the smaller storage rooms, which have a 12 ft. clear vertical dimension. The 12 refrigerated rooms have a combined capacity of 20,000,000 pounds.

Layout of this plant features order assembly areas. These consist of a corridor across the face of the storage rooms at each end of the building, which areas are refrigerated. Refrigerated storages open into this corridor and the corridor opens on to the docks.

Docks, corridors and refrigerated spaces feature bumper guards or blocks, eight inches off the walls. This assures circulation of refrigerated air around product in the controlled temperature spaces and protects the walls. The floors in the refrigerated spaces are outlined with paint and numbered for product placement.

(More on Page 32)





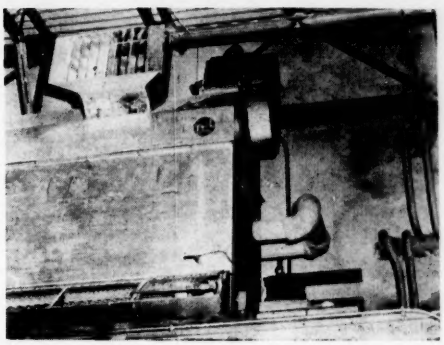
Above, spacious engine room at the Airline highway facility, provides accessibility for maintenance work and for future machinery additions.

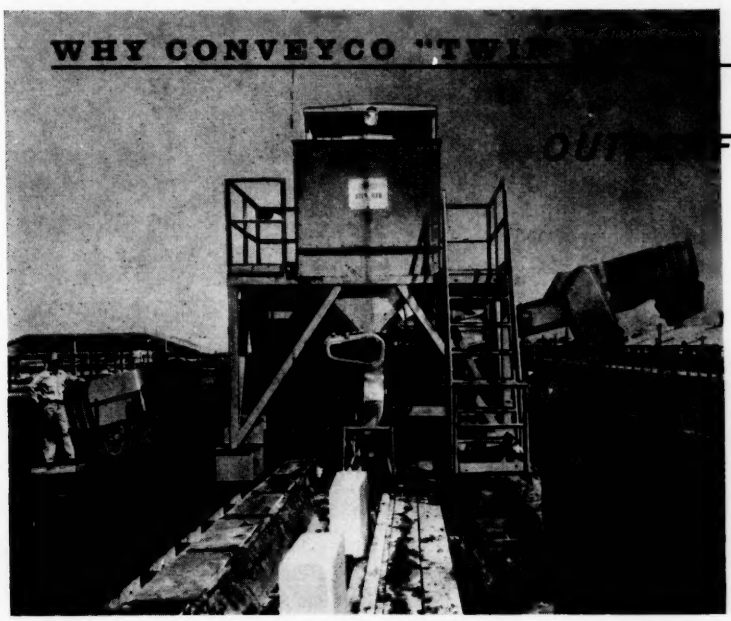
Pictured at left are two 40-hp, 1200-rpm, direct driven, 12-cylinder 3¾ x 3-in. reciprocating boosters. At right are three 75-hp high stage compressors utilizing same size pistons and stroke but having only 8 cylinders each.

A 100 hp rotary booster is in the center background.

Pictured upper right, are high and low temperature ammonia circulating, and liquid transfer pumps of 2, 3 and 5-hp respectively.

Right, typical blower units of varying surface and fan hp, used in cooler and freezer rooms.





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This fast two man machine is nearly twice as fast as competitive models that require 4 to 5 men for operation.

A new ice breaking principle breaks the ice blocks to bunker ice faster with amazing uniformity of size.

The Conveyco Dock Icer design eliminates much heavy and expensive auxiliary equipment, giving a lighter overall weight. Major savings are reflected in lighter dock construction.

Both hatches of a railroad car can be iced at the same time. An automatic salting unit controlled from the cab permits simultaneous bunker icing and salting...gets the job done in half the time.

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ENGINEERS AND MANUFACTURERS

Field Trip Feature of the NAPRE Convention

Traveling Dock Offices

Two portable clerks offices are provided on each dock. When handling large movements of product into or out of the spaces, these traveling offices reduce considerable waste motion as they can be spotted at the shipment point. Made of corrugated asbestos and glassed on three sides, these 6 x 8-ft observation booths are equipped with plug-in devices for heat, light and communication. They are equipepd to be moved by lift truck, having rubber tired ball bearing wheels at one end and a fork hitch at the other.

Community Services

NAPRE visitors will learn from Host Brooks, how a public distribution warehouse serves a metropolitan community. The General Manager will use potatoes in cooler storage as one example, showing that the New Orleans taste for this American staple varies with the region in which the crop is grown. Potatoes come into New Orleans from California, Idaho, Colorado, Nebraska, Michigan and Maine. Storage arrangement will make it easy for the visitors to identify each variety. From this storage, the commodity moves to both chain and independent retailers.

Other commodities in cooler storage to be observed are beans, pecans, flour, cornmeal and cheese. Packaged commodities in storage will include items for the school lunch program, including hams. Realizing that many of the delegates have children in school, Brooks intends to bring home a few points of community service that the engineer and his neighbor often overlook.

New Orleans Frosted Foods is one Division of General Foods Corp. Although many of the NAPRE members will be familiar with this operation, Brooks feels that there are a few innovations worth pointing out.

Dock traveling clerk's offices such as this eliminate wasted office-to-dock foot travel.

Humidity Importance

Being familiar with the tendency among some operators to lack respect for close operating principles, President Brooks intends to point out the importance of humidity to one cooler commodity. Cased canned milk is a product requiring close relative humidity tolerance. The engineers will be acquainted with the rust promoting tendency of condensation and its label destroying characteristic. In this manner, the field trip host feels that the engineer may go home better impressed with the importance of being competent in his job.

Visit Engineering Space

Alfred G. Godshall, Chief Engineer at the Airline plant, joins host Brooks at this point to describe the equipment and the operating practices within the plant.

Refrigeration is accomplished by means of a two-stage, liquid ammonia recirculating plant which regulates air temperatures within the 12 storage rooms. Sixteen blowers are utilized to circulate the chilled air within the rooms. Defrosting of these coils is by hot gas and water. Control of the defrosting is from the refrigerated corridors.

Liquid ammonia is circulated to the cooler rooms by means of two 2-hp positive displacement pumps. Two 3-hp pumps are used similarly to circulate refrigerant to the freezer rooms. A 5-hp liquid transfer pump is used to return excess liquid from the accumulator and intercooler to the receiver. Control of the liquid is by means of Alco *Lectro-Levels*.

Another innovation for tight-turn spots is this 4-direction dolly (above). Fork lifts take over the double tiered load at this point on the rail dock.

Right, this N.O. firm advertises a 12-ft. clear stacking height; they don't mean ceiling level as this photo shows.

Reciprocating and Rotary Boosters

Boosters take suction from the engine room low pressure receiver or accumulator, and discharge through the intercooler to the highside machines. Two boosters and three high stage machines are reciprocating multi-cylinder units direct driven by 440-volt motors. A rotary booster is employed when freezing operations or low temperature processing is required.

Controls and Recordings

All compressors and pumps are operated automatically and controlled from a central board, although local manual controls are also provided at each machine. The only exception to automatic controls is the rotary booster which must be manually started and stopped.

Thermocouples are provided in each refrigerated space and at strategic points on engine room equipment. Customary suction, intermediate and high pressure refrigerant gas, plus supply and return liquid pressures and temperature readings are recorded. Other thermocouple stations are read by selection on an indicating meter, and logged by the watch engineers.

New Orleans Cold Storage Co. also operates another refrigerated warehouse in the downtown vicinity of this Mississippi Delta city. It has a capacity of 1,500,000 cu. ft. The firm has been in business at New Orleans for 50-years.

Industry Meetings

Chemical Processing — **Nov. 30 - Dec. 4**
27TH EXPOSITION OF CHEMICAL INDUSTRIES
New York Coliseum

Practical Refrigerating Engineers — **Dec. 9-11**
NATIONAL ASSOCIATION OF PRACTICAL REFRIGERATING ENGINEERS
Roosevelt Hotel, New Orleans

Maintenance — **Jan. 25-28**
PLANT MAINTENANCE & ENGINEERING SHOW
Convention Hall, Philadelphia

Company Truckers — **Jan. 28-29**
PRIVATE TRUCK COUNCIL OF AMERICA, INC.
21st Annual Convention
Roosevelt Hotel, New York City

Air Conditioning Exposition — **Feb. 1-4**
2nd SOUTHWEST MEETING & AIR CONDITIONING EXPOSITION
Memorial Auditorium, Dallas, Texas

Refrigeration & Air Conditioning Engineers — **Feb. 1-4**
AMERICAN SOCIETY OF HEATING, REFRIGERATION AND AIR CONDITIONING ENGINEERS, INC.
Baker Hotel, Dallas

Poultry Conference — **Feb. 12-14**
INSTITUTE OF AMERICAN POULTRY INDUSTRIES
1960 Fact Finding Conference
Municipal Auditorium, Kansas City, Mo.

Practical Refrigeration — **Feb. 26, 27**
PACIFIC COAST CONFERENCE, NAPRE
CALIFORNIA CHAPTER NO. 2
Los Angeles, Calif.

Frozen Food Packing — **Mar. 6-10**
NATIONAL ASSOCIATION OF FROZEN FOOD PACKERS
Conrad Hilton Hotel, Chicago, Ill.

Power Forum — **Mar. 29-31**
ILLINOIS INSTITUTE OF TECHNOLOGY
22nd Annual American Power Conference
Hotel Sherman, Chicago

Air Conditioning Conference — **Apr. 27-30**
WESTERN AIR CONDITIONING INDUSTRIES ASSN.
Shrine Exposition Hall, Los Angeles

Meat Packing — **May 12-15**
NATIONAL INDEPENDENT MEAT PACKERS ASS'N.
Ambassador Hotel, Atlantic City

FREEZING SPECIALISTS, that is!

Howe Refrigeration Equipment . . . compressors, components, or entire systems . . . can be correctly engineered to the exact requirements of your individual plant. Right-size-for-the-job equipment often spells the difference between problems and profits. Before you buy—it will pay you to know Howe!

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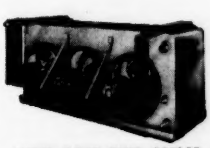

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For freezer as well as normal temperature food storage.

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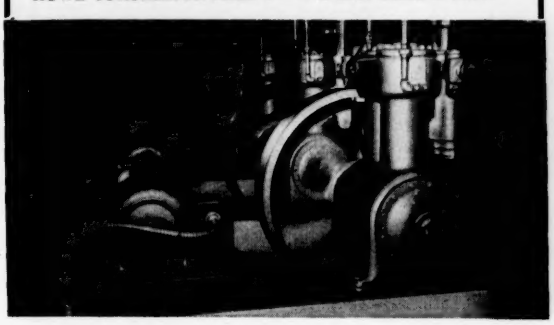

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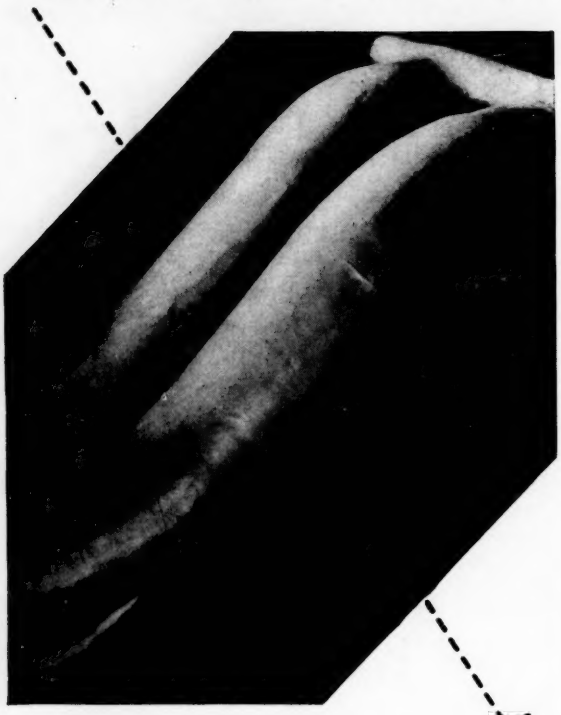

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Industrial Safety

▶▶▶ "SAFETY IN THE SIXTIES" was the theme of the 47th National Safety Congress held in Chicago, October 19-23. The National Association of Refrigerated Warehouses, Inc. was designated a 1959 winner of the National Safety Council's Association Safety Award. This is the second time the NARW safety program has won this distinction.

The Safety Congress, the world's biggest safety show, attracted over 12,000 safety specialists from the U.S., Canada and several foreign countries. It featured 300 sessions on all forms of safety. There were nearly 200 exhibits of safety equipment and materials. Sessions of the Congress had to be held in eight of Chicago's largest hotels.

NARW Achievements

▶ The Association Safety Award went to NARW for a substantial reduction in the accident frequency rate of its members over the past five years. The NSC award is made annually on the basis of improved safety experience, and new or expanded safety activities. NARW previously won this award in 1955.

In advising NARW that it won the 1959 Award, NSC President Howard Pyle said, "On behalf of the National Safety Council and its Committee of Award Judges, please convey our appreciation of your fine work to your officers and to your members. Your outstanding program not only deserves this recognition, but what you have done adds immeasurably to our knowledge of successful association safety work."

New Safety Booklet

▶ Workers employed by member companies of the National Safety Council were hurt less often in 1958 than in 1957. However, the injuries they suffered were slightly more severe. This trend had also been noted by NARW and the NAPRE in their annual safety reports to their respective association memberships. To inject fun, color and showmanship into industrial safety programs, the National Safety Council is making available to associations, a new 96-page illustrated booklet, SHOWMANSHIP IN SAFETY.

This all-new second edition of the booklet gives associations the key to a successful safety program. Each page contains ideas for stunts, demonstrations and promotions that will help build interest, create favorable attitudes, and bring a change of pace and a dash of color into safety efforts.

Safety Award to Crystal Ice

▶ Six safety awards were presented to Crystal Ice and Cold Storage Co. of Sacramento, Calif., on October 3. On that date, the company celebrated a 50th anniversary dinner in Johnson's Del Prado Restaurant. A. R. Carstensen, President and General Manager of the firm, is the Vice President of NARW and had been chairman of the association's safety program for several years.

The awards, according to THE SACRAMENTO BEE were given out by Cyd P. Westington, engineering superintendent of the California Casualty Indemnity Exchange of San Francisco; William C. Baker of Chicago, president,

More ▶

CONGRESS CITES NARW PROGRAM

and Richard M. Powell of Washington, D. C., executive vice president of the National Association of Refrigerated Warehouses, Inc., and by James J. Kennedy, president of the Sacramento Safety Council.

Included in the awards was a certificate of recognition of three years with no lost time accidents, from the California Casualty Indemnity Exchange. There were two certificates from the National Safety Council: one the Council's Safe Driver Award and the other a certificate of commendation for 250,000 man-hours of operation without a disabling injury. Two more awards were from the NARW, one being the regular safety award for a non-accident year, and the other NARW's new award of merit which paralleled the California Casualty award.

Another California Award

Another company award of NARW merit designation, was Turlock Refrigerating Co., Turlock, Calif., which like Crystal Ice had completed a total of 250,000 man-hours without a lost time accident.

Since the regular safety awards presented at the annual NARW meeting, April 1959, two more member firms have earned these citations. They are: Upton Cold Storage Co., Rochester, New York with completion of two consecutive accident-free years and Eastern Pensylvania Storage, Inc., Wilkes Barre, Penna. for a four-year no-accident record.

Another NARW Safety Award of Merit was presented to Merchants Refrigerating Co., Vinita Park plant, St. Louis, Mo. Merchants' was the third of these awards.

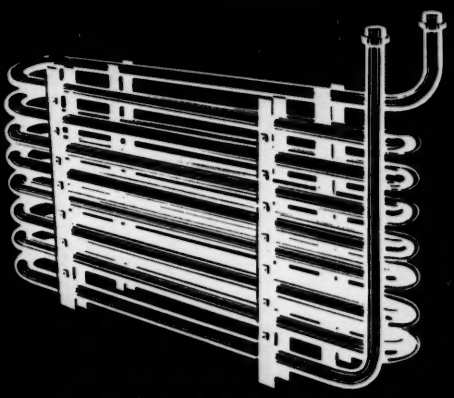
Dick Powell, executive vice president, NARW, pointed out that percentagewise, the frequency of accidents in the refrigerated warehousing industry has been reduced 40% since 1952 and the severity rate by 80%. Vice president Carstensen is credited by the National Association's current safety chairman, A. W. Oakley, Jr., with playing a major part in the industry's safety achievements.

Literature Highlights

Safety literature, of course, flowed freely from the Congress and Exposition. Probably the most useful promotional agent it was emphasized is the poster. Again, NARW received recognition. The National Safety Council highlighted the fact that Joe Colquitt, secretary, NARW, had ordered 600 more NSC posters, reporting that the association's safety poster campaign was a tremendous success.

Articles from various publications were cited in some of the literature. A safety message from NAPRE President Roy T. Burns, published in INDUSTRIAL REFRIGERATION early in 1959, was among those cited. Another bulletin cited THE MECHANICAL CONTRACTOR. An article in that publication had highlighted the fact that mechanical contractors, including refrigeration and air conditioning erection firms, were losing a million dollars per year because of accidents. Workmans compensation alone was costing $100.00 per employee.

BEST'S FIRE AND CASUALTY NEWS SURVEY was also quoted in an NSC bulletin. That publication had stated fifty out of fifty-six insurance carriers surveyed reported that they could not curtail their engineering service because safety was not yet thoroughly integrated in the management of their assureds.



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NATIONAL QUALITY also guarantees effective service in CONVERTORS (our new Catalog 592), HEATERS & HEAT EXCHANGERS (our new Catalog 591).

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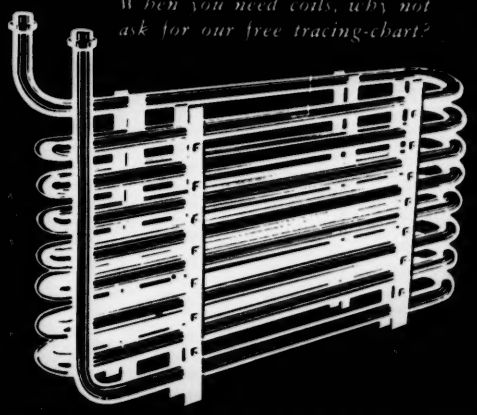

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REFRIGERATING PEOPLE MAKE NEWS

(Continued from Page 6)

Recold Appointments

WORKS MANAGER for Recold Corp., Los Angeles, is **Carl Baumhofer,** it was announced by **H. T. "Hy" Jarvis,** president, August 25. Baumhofer is pictured with **Ernest W. Jarvis,** secretary-treasurer and operations manager.

As Works Manager, Baumhofer's duties will include planning, organizing, directing and controlling all production operations. He is a graduate mechanical engineer, University of Cincinnati, and has previously been employed by Servel Corp. and another Los Angeles appliance manufacturer where he had been assigned production design engineering, tooling and purchasing assignments.

Recold also announced earlier that Archer-Hinman Supply Co. of Tulsa, Okla., had been named as the wholesaler for their products. **D. Jack Archer** and **Roy H. Hinman** are partners in this firm.

Export Business

EXPORTS have jumped 30 percent in the first quarter of 1959 as compared with the first quarter of 1958 for Recold Corp. This increase includes the complete line of the firm's air conditioning and refrigeration products although a significant part is represented in supermarket installations which are literally springing up around the world, according to "Hy" Jarvis, president of Recold and **Albert Rebel,** president of Recold International Corp.

Wile At Copenhagen

DOING HIS SHARE in the international picture is **Dan D. Wile,** vice-president and chief engineer, Recold Corp. Invited to address the 10th International Congress of Refrigeration at Copenhagen, Wile prepared a paper on Ceiling Type Blower Coils For Modern Refrigeration Applications. This is Wile's second invitation to the International Congress, the previous being in 1936 when he prepared a paper on refrigeration controls.

First vice-president of the American Society Heating, Refrigeration and Air Conditioning Engineers, Wile is a frequent contributor to many publications. His most recent in INDUSTRIAL REFRIGERATION was in January, 1958, entitled "Purposeful Purging," page 12. Another paper in IR was entitled "Proper Refrigeration Increases Meat Profits" in the January 1958 issue, page 31.

The 10th International Congress paper covered the progress that has been made during recent years in the application of this type of equipment to large refrigeration installations. The address emphasized the installation and operating economies that have been achieved in applications extending over the entire range of refrigerated temperatures, from quick freezing to carcass cooling.

E. W. Jarvis & C. Baumhofer
Recold Works & Operations Managers

TRRF Represented

SCIENTIFIC Advisory Council Members, TRRF, attending the 10th International Congress included Professor **Carl H. Kayan,** Columbia University and **Dr. W. T. Pentzer,** USDA. According to the TRRF Information Bulletin, August 1959, they presented research results of TRRF sponsored projects in addition to representing the United States on several commissions.

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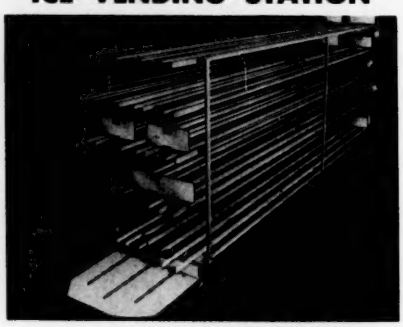

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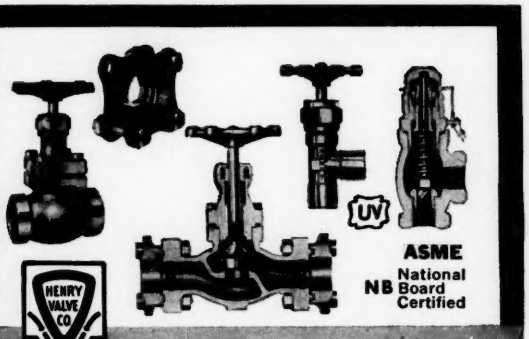

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VALVES AND ACCESSORIES FOR REFRIGERATION AND INDUSTRIAL APPLICATIONS

ARMSTRONG REORGANIZES RESEARCH CENTER

J. E. Hazeltine

R. B. Rohrer

B. R. Billmeyer

▶▶CHANGES IN management organization of the Armstrong Research and Development Center, Lancaster, Pa., were announced in August by **F. B. Menger,** Director of Research, with further emphasis that more new product development is the objective of the administrative changes.

Named to position of Associate Director of Research is **R. B. Rohrer.** In addition to sharing administration of the center, his major responsibility will be the direction of the physical and chemical research for Armstrong Cork Co., as well as administration of universities and professional institution projects sponsored or contracted by Armstrong.

Two new assistant directors are **J. E. Hazeltine,** in charge of divisional research, and **B. R. Billmeyer** in charge of research administration. Hazeltine will direct and coordinate development work of the Building, Floor, Industrial and Packaging Materials Divisional Research Groups. Billmeyer becomes Business and Personnel Administrator.

R. A. Garrett succeeds Billmeyer as general manager of Industrial Products Research. **A. H. Johnson** succeeds Garrett as manager of Rubber Products Research. **D. T. Zentmyer** succeeds Hazeltine as manager of Plastics Flooring Research. **G. W. Koehn** has been named general manager, Consumer Products Research. **H. C. "Hank" Brown** has been appointed general manager of Special Projects reporting to the Director. Brown who had previously identified himself in refrigeration research will continue to serve as a member of the company's Residential Building Task Force. "Hank" Brown is the author of "Testing Facilities For Refrigerated Warehouse Construction" which was published in INDUSTRIAL REFRIGERATION in February (page 13) and March (page 19), 1956.

Air Conditioner Order Breaks Up Vacations

▶▶AEROJET-GENERAL CORP. had placed an order with Vilter Manufacturing Co. for an air conditioning unit to be used in environmental testing of liquid fuel rocket engines. Delivery date specified early September.

Vilter, like many manufacturing firms shuts down annually for a 2-week vacation period for most all employees. In the second day of vacations, Aerojet-General Corp., one of the nation's major missile contractors indicated that the Defense Department wished to advance delivery. That was Tuesday. A handful of employees were recalled from vacations, the job was sped to completion, and the following Friday, the unit was being flown to the West coast, according to the MILWAUKEE JOURNAL.

Transicold Expands

▶▶ SCHEDULED for mid-December is an expansion move by Transicold Corp. to 1100 Taylor Avenue, Montebello, Calif. from their Hooper Avenue address in Los Angeles. The firm which manufactures transport refrigeration and mobile air conditioning equipment is headed by **John H. Grim,** president, **M. W. Brainard** and **R. L. White** vice-presidents. The announcement was made in Los Angeles County Chamber of Commerce's INDUSTRIAL DEVELOPEMENT.

More ▶

6-Station unit: 240—5" x 4¼" packages per freeze . . . all refrigeration and hydraulic equipment self-contained . . . uses R22 refrigerant . . . only 17 sq. ft. of floor space required . . . patented DOLE "Thermo-Film" feature increases freezing speed up to 10% . . . installation requires only electrical, water and drain connections.

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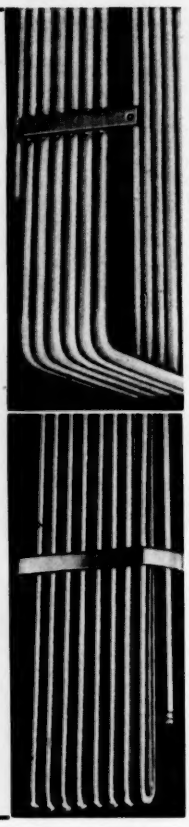

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Ohio Special Ice Cans are fabricated from finest quality Prime Galvanized Steel Sheets; formed accurate to size and straight for fast harvesting of ice.

Ice Can Grids or Baskets are designed to lift any number of ice cans and are Hot-Dip Galvanized after fabrication.

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MANUFACTURERS NEWS & OBITUARIES

Mississippi Plants

▶▶ TESCO CHEMICAL of Atlanta, Ga., announced in September the location of a plant at Edward, Miss., 18 miles West of Jackson. The firm, which manufactures chemicals for water treatment in refrigeration, textile processing, institutional and industrial maintenance, metal conditioning, boiler treatment and wood preserving, is one of three new plants for the Jackson area, according to the MISSISSIPPI AGRICULTURAL AND INDUSTRIAL BOARD.

▶ General Mills is installing equipment for an egg grading operation in Jackson and will enter into production contracts with egg producers within a 50-mile radius of the city. Total cash outlay of the plant, including the payroll and payments to egg producers is estimated at $1 million annually.

▶ Dowell Division of Dow Chemical has recently located a plant in Jackson. This division is also engaged in water treatment, as well as fracturizing and acidizing techniques for oil and gas production.

Presstite Changes Name

▶ Presstite Engineering Co. of St. Louis was purchased by the American-Marietta Co. three years ago, and consolidated with American-Marietta's Keystone Asphalt Products Division. It became known as Presstite-Keystone Engineering Products Co., Division of American-Marietta Co.

The name has now been officially changed, according to **Cyril H. Smith,** President and General Manager of the Company, and the company will henceforth be known as the Presstite Division, American-Marietta Co. The St. Louis company with plants also in Jackson, Mich., El Segundo, Calif., and Chicago Heights, Ill., is one of the country's leading manufacturers of industrial sealing compounds of all kinds.

New FES Representative

▶▶ SOUTHERN California representative for FES-Fuller rotary boosters, is Tennico-Inc., Los Angeles, announced early in September by officials of Freezing Equipment Sales, Inc., York, Pa. **David Nurse,** formerly manager of Holland-Nurse Co., North Hollywood, Calif. will handle sales in Southern California, Southern Nevada and Arizona.

Robert B. Holland Co., San Mateo, Calif. will continue to represent the line of rotary boosters in Northern California, Oregon, Washington and portions of Idaho.

Ammonia Appointments

▶▶ AUGUST APPOINTMENTS of Ammonia Sales Representatives by Nitrogen Division, Allied Chemical Corp. are as follows:

Hamblet and Hayes Co., Peabody, Mass., will handle sales for Barrett Brand Anhydrous Ammonia in cylinders throughout Massachusetts; Wm. Lynn Chemical Co. Inc., Indianapolis, Ind., will handle anhydrous ammonia in cylinders throughout Central Indiana.

Environmental Work

▶▶ CONTRACTS to furnish fundamental test equipment for the new U. S. Army Ordnance Research Laboratory at the Picatinny Arsenal in New Jersey have been awarded the International Radiant Corp. The announcement came from **Col. Champlin Buck,** Commanding Officer of the Arsenal. According to **Bernard Friedman,** general manager and technical director of the Westbury, New York firm, the contract calls for a series of environmental chambers.

The Picatinny Arsenal will employ temperature—altitude—humidity simulation chambers to 20,000 ft and 400 F, full humidity range; chambers from minus 100 to 250 F with partial and full humidity ranges. The firm also manufactures equipment for aviation, electronic, metallurgical, pharmaceutical and food processing industries in addition to their environmental test equipment line. They also serve as consultants on diversified projects.

Dunham-Bush Appointments

▶▶ RECENTLY announced by **James A. Mulcahey** vice-president-sales, Dunham-Bush, Inc., is the appointment of **Robert McCulloch,** sales engineer, New York City; **Wallace G. Hamilton,** application engineer, Minneapolis; **William G. Smith,** sales engineer, St. Louis territory.

American Appointment

▶ REFRIGERANT-chemicals sales manager for American Potash & Chemical Corp. at Los Angeles is **W. E. Horn,** according to SOUTHERN CALIFORNIA BUSINESS.

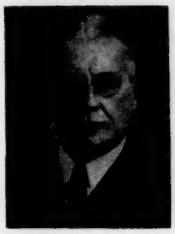
Foam Insulations

▶▶ ISOCYANATE PRODUCTS, Inc., announced its association with The Shelley Co. of Los Angeles, Calif., for the sale on the West Coast of the *Isofoam* urethane resins and *Newton* Urethane Mixing Equipment. Shelley will maintain demonstration facilities for both the foaming chemicals and equipment in its Los Angeles location.

Ben Hammond Dies

▶ PIONEER real estate and cold storage developer, **Ben F. Hammond, Jr.,** died at Memphis on August 21. The 82-year-old native of Clanton, Alabama, had made his home in Memphis since 1908. When he retired from the real estate business in 1942 he joined with his son Jeff Hammond to organize Tennessee Cold Storage Co., according to the MEMPHIS COMMERCIAL APPEAL.

Link-Belt's Kauffman Dies



FORMER PRESIDENT of Link-Belt Co., and a director for 37 years, **Alfred Kauffmann** died in Chicago August 7, age 79. Born in Esslingen, Germany, Kauffmann came to the United States at 5 years of age and received his early education in New York and New Jersey public schools. He studied mechanical engineering at Cooper Union and Pratt Institute.

Joining Link-Belt Co. at Philadelphia, as a draftsman, Kauffmann later served as superintendent of construction and sales engineer. In 1913, he came to the company's general office in Chicago as assistant to the president, and after serving as manager of the Eastern Division and the Indianapolis head, he was elected president in 1924 to serve for eight years.

He was reelected again in 1936 and held the presidency until 1943 when he retired. He was a director of the company until his death. He was also a director of Armour Research Foundation, Illinois Institute of Technology, Gardner-Denver Company, Cardox Corp. and LaPlant-Choate Co., Inc.

Ice Veteran Passes On

OWNER of the Nettleton Ice Co., **Tom Weston Burress**, age 60, died in Jonesboro, Ark., September 1, according to the GAZETTE STATE NEWS SERVICE. He was a native of Mississippi.

A VETERAN of the Spanish-American War, and a refrigeration engineer for many years, **Oren E. Evans, Sr.**, died at Veterans Administration Hospital, Houston. A native of Bement, Illinois, he had spent a good number of his years in the Houston area. He had survived his son, Oren E. Evans, Jr., a prominent Houston jeweler, according to the HOUSTON CHRONICLE.

C. E. Leon Deceased

SWIMA NEWS NOTES in August carried an item on the death of **C. E. Leon**, a 30-year veteran of the ice industry. A native of Texas, Mr. Leon had operated a chain of ice manufacturing and frozen locker storages in West Texas under the name of Leon Ice Co. He collapsed in a Dallas Hotel room while talking with his daughter and son-in-law early in June. He had been Mayor protem of the City of Rotan, Texas, served on the City Council for about 18 years . He had led work in securing an adequate water supply for the city and was a school trustee for a number of years.

VAN RENSSELAER H. GREENE ASSOCIATES

CONSULTING ENGINEERS

VAN R. H. GREENE — NILS R. BERNZ

REFRIGERATION SPECIALISTS

COLD STORAGE—FOOD PROCESSING—INDUSTRIAL

ENGINEERING SURVEYS, APPRAISALS, COST STUDIES,
COMPLETE ENGINEERING DESIGNS FOR TEMPERATURE AND HUMIDITY CONTROL.

11 PARK PLACE **NEW YORK 7, N.Y.**

Classified Advertising

All classified advertisements are payable in advance. Except for Positions and Help Wanted classifications, this section is reserved exclusively for USED equipment.

RATES: 20c per word; minimum 25 words. $2.00 per line for bold face headings: $15.00 per inch for line listings.

USED EQUIPMENT—wanted & for sale

FOR SALE — Halstead Mitchell cooling tower Model WT 3014 with make-up tank and circulating pump, D. Kelton, 5746 Broadway, New York 63, N.Y. Phone KI 3-6460.

WANTED — approx. 50,000 sq. ft. of cork or styrofoam insulation. Must be reasonable. Write Fruit Haven, P.O., R.D. 3, Sewell, New Jersey.

FOR SALE — Used Marley 19-101 series 8 double flow Aquatower, installed 1956, maximum 1280 g.p.m. Location Seattle, Washington. Write Safeway Construction Department, 1200 Westlake Ave. North, Seattle, Wash.

FOR SALE — York 7½x7½, York 8x8 Model D6, York 9x9 Model D6 compressors; complete with AC motor and starter; ammonia receivers, shell and tube condensers, Uline type 3 ice cuber, Carrier self-contained methyl chloride compressors; individual room coolers or diffusers; thousands of feet of galvanized ammonia pipe. Write for free listing. Chas. S. Jacobowitz Corp., 3080 Main St., Buffalo 14, N. Y. Phone AMherst 2100.

REFRIGERATION EQUIPMENT FOR SALE

Advise Us Your Needs

Use QUICKSEAL—stops brine tank leaks.
Use CLERTEMPICE—clears and tempers ice.
Born Company 80 East Jackson Boulevard.
Chicago 4, Illinois. WAbash 2-3299.

WANTED — 360 ice cans, 400 pound, 11 x 22, with or without grids. Write full details to Box OT-3, % Industrial Refrigeration.

WANTED — Used ice plants, all sizes, either complete or component parts. Quote prices loaded on cars only; itemize, giving size, horsepower, etc., with statement on condition. Address Box OT-4, % Industrial Refrigeration.

FOR SALE — York ammonia refrigeration system of about 7½ tons capacity including two cylinder 4x4 compressor, 10 h.p. motor, evaporative condenser, 10"x84" receiver, 350 ft. of finned evaporator coils and all control apparatus. Also available, Link Belt boom type tiering machine. Equipment now available at El Paso, Texas. For further information contact E. F. Gaebler, Chief Engineer, Pacific Fruit Express Co., 116 New Montgomery St., San Francisco 5, Calif.

FOR SALE — AMMONIA EQUIPMENT

3—15 ton complete Frick ice making plants, new, in crates, no air system, sold as used.
2—10"x10" 4 cyl. Carbondale duplex DC to 225 h.p. 300 r.p.m.
1—9"x9" 4 cyl. York duplex DC to 150 h.p. motor, 300 r.p.m.
2—9"x9" 2 cyl. York DC to 75 h.p. motor.
1—10"x10" 2 cyl. York DC to 125 h.p. motor.
1—9"x9" 2 cyl. Frick compressor.
1—6½"x6½" 2 cyl. York compressor.
1—3"x3", 1—4"x4", 2—5"x5" condensing units. 3x3", 4x4", 5x5", 6x6" compressors.
11x22x51" 300 lb. ice cans, also 11x22x47" ice plants, 25 to 100 ton capacity, complete.
10 shell & tube condensers, 25 ton capacity.
1—300# Gifford Wood cubing machine.

ENTERPRISE EQUIPMENT CORPORATION
328 Bryant Ave. Bronx 59, N.Y.
Cable ENTREMA Phone DA 8-2121

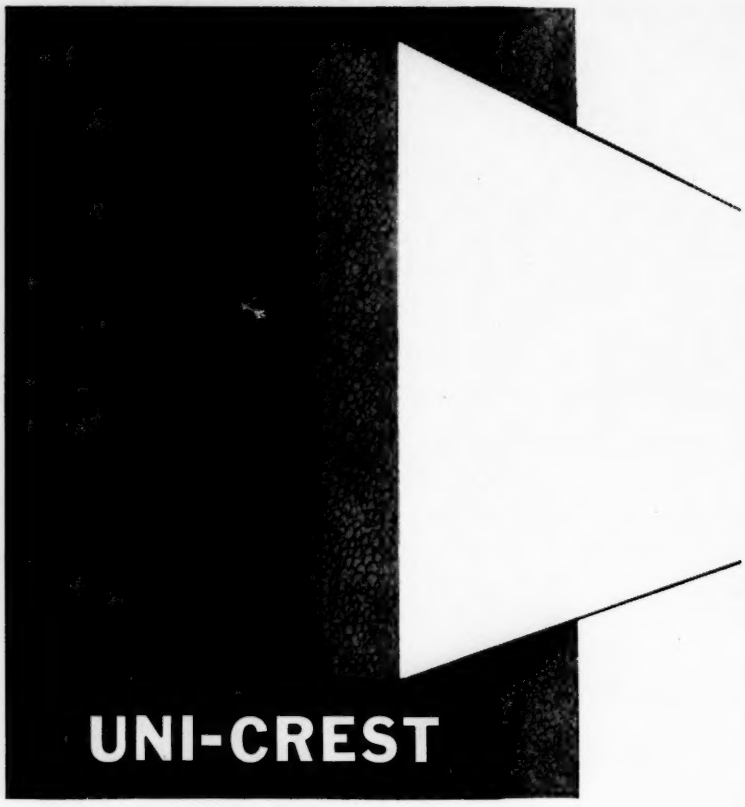
Position and Help Wanted

WANTED — Manufacturers' Representative desires industrial refrigeration specialty lines; New England States and upstate New York. Covering ice and cold storage plants, apple storage, ice cream plants, etc. Write Box NV-8, c/o Industrial Refrigeration.

REFRIGERATION SALES ENGINEER

Rapidly expanding, well established West Coast industrial refrigeration manufacturer has excellent opportunity for aggressive sales engineer. Must have engineering degree or equivalent; minimum of three years refrigeration sales engineering experience in quick freezing, cold storage and process refrigeration. Most important, must be aware of dynamic potential of the industrial refrigeration industry. Excellent salary and commission; outstanding company benefits; car allowance and expenses. Send detailed resume to C. R. Kohlenberger, president.

KOHLENBERGER ENGINEERING CORPORATION
1600 W. Commonwealth Ave. P.O. Box 432
Fullerton, Calif.



a new foam plastic insulation of outstanding properties

Uni-Crest is an extremely lightweight homogeneous white material with a smooth, tough surface. It is composed of minute, individually closed cells, produced by expanding beads of polystyrene. Its inherent properties make it an excellent low temperature insulating material.

Uni-Crest has a low K factor (thermal conductivity) and retains its insulating value indefinitely. Lightweight, strong, flexible, it has excellent bonding characteristics, is non-dusting and non-flaking, and can be cut and handled easily. Uni-Crest is inexpensive, too.

Uni-Crest is available in widths up to 4′, lengths to 12′ and thicknesses from 1″ to 8″. Self-extinguishing Uni-Crest is also available in the same sizes. Write today for complete specifications and installation information.

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KRAMER

BETWEEN THE RAILS UNIT

Photo - ROYAL CASTLE COMMISSARY, MIAMI, FLA.

KRAMER Presents a New Evaporator Principle

B-R unit combines all the advantages of the gravity coil with the advantages of the fan type unit. The result of years of research and development, it is the evaporator that answers the problem when the installation requires that "extra" in performance.

LOW AIR VELOCITY: Discharge velocities are no higher than a gravity coil—there are no air blasts. Ideal for installations where people must work in a refrigerated room.

NO DEAD AIR SPOTS: By distributing the B-R units over the ceiling area, even temperature and humidity conditions can be maintained throughout the area.

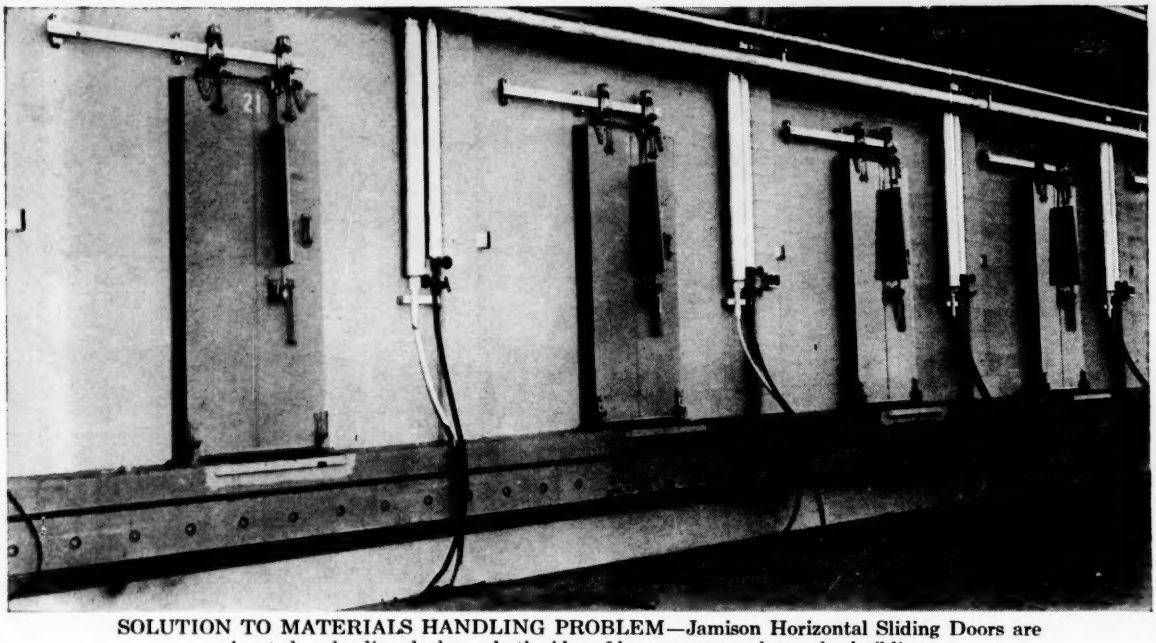
SPACE SAVER: Fits between the rails without hindering the movement of the stored product; it takes no usable space.

IDEAL FOR THE MEAT INDUSTRY: The B-R unit has proven very successful in the refrigeration of fresh meat. Shrinkage is cut to an absolute minimum, slime and mold are controlled, and the bloom and flavor is maintained. Ideal for carcass chilling, meat cutting rooms, meat storage rooms, aging rooms, smoked meat storage as well as pork, bacon and sausage rooms, etc.

MANY APPLICATIONS: Can be furnished with a hot gas heated pan for temperatures below 30°. Available as an "F" or "L" THERMOBANK system with or without the compressor for temperatures of 32° or lower. The B-R designs include units for Refrigerant 12, Refrigerant 22 and ammonia.

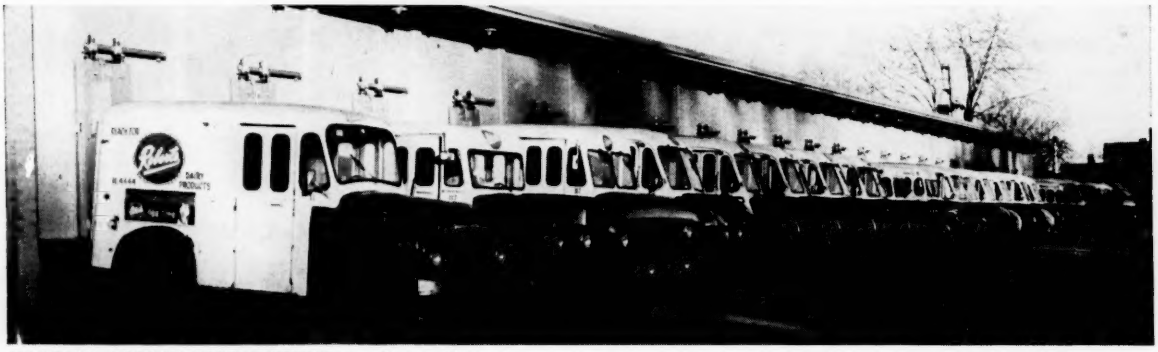
Write for Bulletin R-462

KRAMER TRENTON CO. • Trenton 5, N.J.



SOLUTION TO MATERIALS HANDLING PROBLEM—Jamison Horizontal Sliding Doors are located on loading docks on both sides of long, narrow sales-cooler building.

48 Jamison doors speed handling in new dairy sales-cooler building

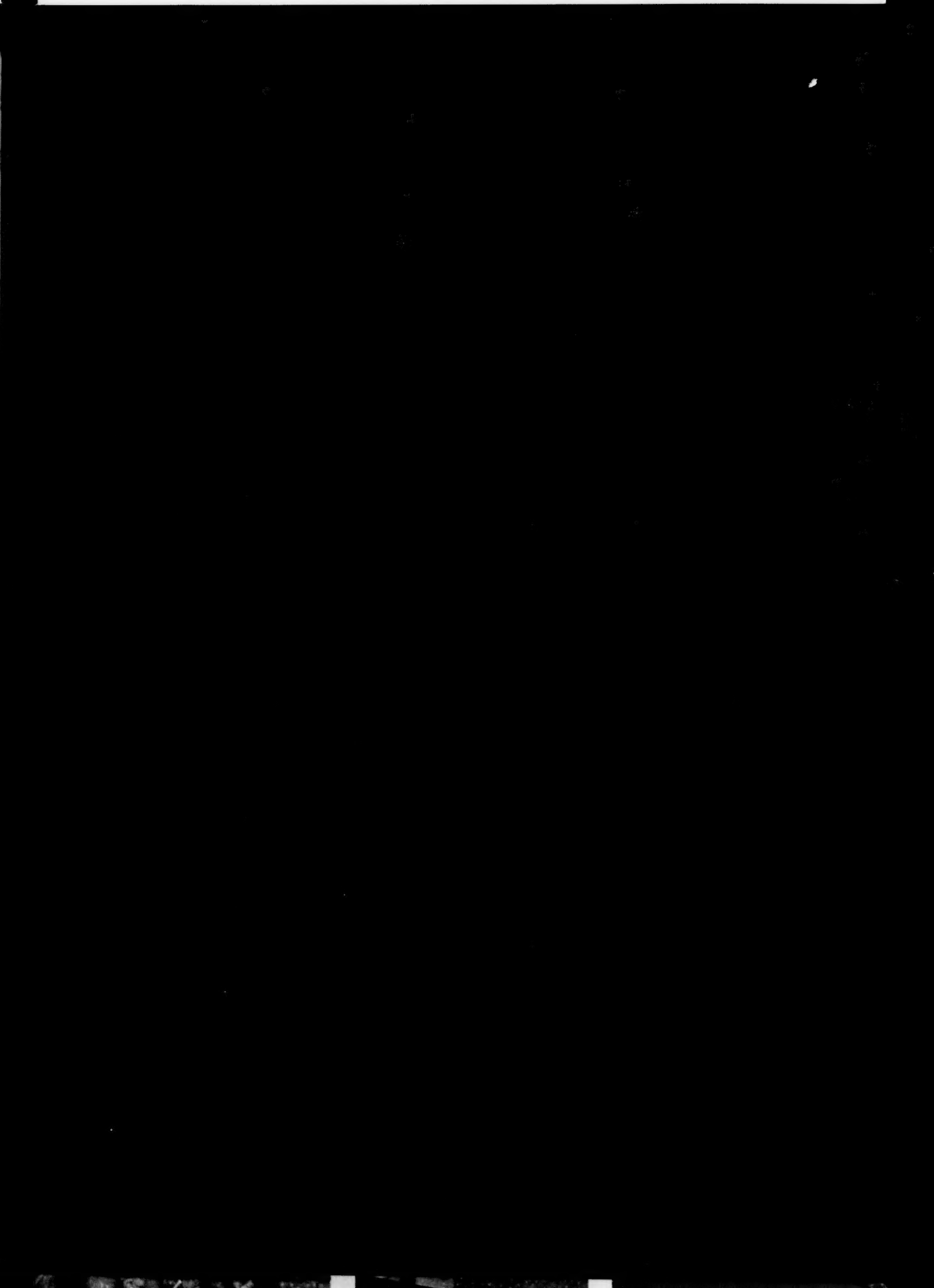


FASTER, MORE CONVENIENT loading and unloading. 48 loading stations prevent costly truck delays, speed deliveries.

SPACE-SAVING Horizontal Sliding Doors facilitate high volume movement of dairy products.

Architects: Cecil A. Martin & Associates—Omaha, Nebraska
Hertel, Johnson, Elpper, Stopa—Chicago, Ill.
Insulators: Low Temp Insulations—Omaha, Nebraska
Contractors: A. Borchman & Sons—Omaha, Nebraska

• In a unique demonstration of modern dairy efficiency, the Roberts Dairy Company, Omaha, Nebraska, has accelerated handling and streamlined operations with a new 241′ long sales-cooler building. Jamison Single-Leaf Horizontal Sliding Doors are an important feature of this new facility.

The doors are designed to save space, minimize refrigeration loss and to provide easier, faster loading and unloading. Jamison doors are available in many types and sizes for practical, economical solutions to any problem. For additional data, consult your architect or write to Jamison Cold Storage Door Co., Hagerstown, Md.

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